CSIR NEWS

Vol 11; 1961

CSIR NEWS

VOL. II NEW DELHI—JAN. 9, 1961 : PAUSA 19, 1882 No. 1

NCL Pilot Plant Laboratory Opened

Prof. M. S. Thacker, Director-General, Scientific & Industrial Research, opened the newly constructed pilot plant laboratory and workshop of the National Chemical Laboratory, Poona on Dec. 26, 1960. In his opening address, emphasising the role of science in the rapid developments of the country, Prof. Thacker exhorted the Indian scientists to go ahead and catch up with the great progress already achieved in other countries in the field of science and technology.

Prof. Thacker added that he was gratified to find that a number of processes developed at the Laboratory, are now being taken over by the industry for commercial exploitation. He made particular reference to processes for the manufacture of vitamin C and bacterial diastase, which are shortly to be started on commercial scale.

NCL, POONA—Prof. M S. Thacker, Director-General, Scientific & Industrial Research, speaking at the opening ceremony of pilot plant laboratory

M E E T I N G

A meeting of the Civil Engineering & Hydraulic Research Committee will be held at the CSIR Secretariat, New Delhi, on January 13, 1961 at 11.00 a.m. Shri Kanwar Sain, Administrator, Rajasthan Canal Project, will preside.

Symposium on Redox Processes

The Chemical Research Committee of the CSIR is organizing a symposium on Redox Processes at the chemical laboratories of the University of Allahabad during Feb. 1-2, 1961. A large number of scientists and delegates from India and abroad including a delegation from U.S.S.R. are expected to participate in the symposium.

More than fifty papers, received from research chemists and scientists will be presented and discussed in the following technical sessions: Electrode Processes; Reactions; and Analytical Application.

Symposia on 'Upper Atmosphere' and 'IGY Data'

The symposia on 'Upper Atmosphere' and 'IGY Data' jointly organized by the Radio Research Committee of the CSIR and the Indian National Committee for IGY (*CSIR News*, Vol. 10, No. 16, p. 1) will be held at the National Physical Laboratory, New Delhi, during Feb. 13-17, 1961.

A large number of papers pertaining to various disciplines included under the IGY and IGC programmes such as solar activity, cosmic rays, geomagnetism and outer space, ionosphere, meteorology and aeronomy, and the surface and the interior of the earth have been received for presentation at the symposia. Last date for receiving scientific communications has been extended till Jan. 15, 1961.

Institutions and organizations who wish to send their delegates to the symposia should furnish their particulars to Dr. A. P. Mitra, Secretary, Radio Research Committee, NPL Buildings, New Delhi.

P E R S O N A L

● SHRI K.R. ACHARYA has been appointed Technical Information Officer, Publications Directorate, CSIR, New Delhi, with effect from Dec. 29, 1960.

● Shri R.N. SHARMA has been appointed, on promotion, Asst. Editor, Publications Directorate, CSIR, New Delhi, with effect from Dec. 3, 1960.

● DR. C.P. AGARWAL, Senior Technical Assistant has been appointed to officiate as Asst. Editor, Publications Directorate, CSIR, New Delhi, with effect from Dec. 3, 1960 *vice* Shri S. Ranga Raja Rao, on deputation abroad.

● SHRI B. GORUDADWAJAN has been appointed Personal Assistant (Tech.) to the Director, CGCRI, Calcutta, with effect from Nov. 16, 1960.

● SHRI R. SOUNDARARAJAN has been appointed Section Officer, CGCRI, Calcutta, with effect from Nov. 25, 1960.

(*Contd. on p. 2, col. 1*)

BRIEFS

State Award for CSIR Publications

Vigyan Pragati and *Research and Industry* have been awarded First and Second Prizes for *excellence in printing and designing* during 1960, in the competition organized by the Ministry of Information & Broadcasting. The awards have been made under the catogeries: (i) Periodicals (Other than Annuals)—Indian languages and (ii) Periodicals (Other than Annuals)—English.

Shri G. B. Pant, Union Home Minister, presented the award at a ceremony held at Vigyan Bhavan, New Delhi on Dec. 24, 1960.

Bibliography of Analytical Chemistry of Thorium

In view of the recent interest in thorium as a nuclear fuel and/or its separation from uranium, a bibliography of papers published during 1940-1958 on the above subject has been compiled by Sarvashri M. R. Verma, Jitendra Rai & Prabhu Dayal, NPL, New Delhi. The bibliography containing about 1000 entries has been divided into 18 sections. It includes papers on analytical methods and geology, chemistry and metallurgy of thorium. The papers on analytical methods include physical methods as well as rigorous analytical methods based on the use of organic and inorganic reagents, instrumental, chromatographic and solvent extraction methods. A separate section includes papers on the physico-chemical study of reaction of thorium.

The bibliography will be published as Supplements to the *Journal of Scientific & Industrial Research.*

PERSONAL

(*Contd. from p. 1, col. 3*)

● DR. K. VENKATARAMAN, Director, NCL, Poona, has been nominated Chairman, Development Council for Industries engaged in the Manufacture of Organic Chemicals, Ministry of Commerce & Industry.

● PROF. S.R. MEHRA, Director, CRRI, New Delhi, has been nominated a member of the Managing Committee of the Indian National Group of the International Association for Bridge & Structural Engineering.

Shri S.B. Deshaprabhu, Production Officer, CSIR, receiving the prizes awarded to CSIR publications

● DR. T. BANERJEE, Deputy Director, NML, Jamshedpur, has been nominated Chairman of the Methods of Chemical Analysis Sectional Committee of the Indian Standards Institution.

* * *

● DR. B.R. NIJHAWAN, Director and SHRI P. K. GUPTE, Asst. Director, NML, Jamshedpur, have been awarded the Certificate of Merit by the Indian Institute of Metals as co-authors of the *Kamani Award*, best paper presented to the Institute during 1958-59.

● SHRI S.M. ARORA, Junior Scientific Officer, NML, Jamshedpur, has been awarded the *Kamani Gold Medal* for 1958 by the Indian Institute of Metals.

● SHRI S. RANGA RAJA RAO, Asst. Editor, Publications Directorate, New Delhi, who is on deputation to U.K., has been elected a member of the *Institution of Information Scientists.*

Dr. M. N. Ramaswamy

Dr. M. N. Ramaswamy has been appointed Assistant Director, CIMPO (Bangalore Zonal Office), with effect from Nov. 26, 1960.

Born in 1905 at Mysore, he got his education at Mysore and Dacca Universities and worked as Tata Research Scholar at the Indian Institute of Science, Bangalore. Later, he proceeded abroad for higher studies at the Forstliche Versuchsanstalt (Forest Experimental Station), University of Munich, where, after completing the Diploma Course in Forestry, he obtained Doctorate (Magna cum laude) on his thesis, *Beech Forest Crops on Basalt Soils.* Under a Colombo Plan Scholarship he worked in Australia on Minor Forest Products.

He has been responsible for the establishment of the Forest Research Laboratory, Bangalore and he served the Laboratory for 22 years (1938-60), first as Forest Chemist and since 1952 as Chief Research Officer. He planned and completed the preliminary work for the expansion and development of the Laboratory as a Zonal Research Institution in Forest Products for South India. He had been a Special Officer for rayon, Mysore State; In-charge of pyrethrum and lac cultivation in Mysore State, and CSIR Essential Oils Research Centre at Bangalore; and lecturer in minor forest products at the Indian Forest Colleges, Dehra Dun, Coimbatore and Kerala University.

Dr. Ramaswamy is the author of many publications relating to minor forest products and allied subjects. He is a Fellow of the Indian Academy of Sciences and is closely associated with numerous scientific and technical committees of the Central and States Governments and Indian Standards Institution.

RESEARCH IN PROGRESS

National Laboratories

CFRI, JEALGORA

X-ray Study of Indian Asbestos—Samples of chrysotile (an important variety of asbestos indigenous to India) obtained from Cuddapah, South India, have been examined by X-ray using copper Kα-radiation.

The original samples have been found to contain chrysotile ($3MgO.2SiO_2.2H_2O$) as the major phase and calcite ($CaCO_3$) as minor phase with big particle size of its (calcite) chrystallites. On heating the samples up to 650°C., transformation of chrysotile to forsterite($2MgO.SiO_2$) starts and completes at about 800°C. At 1000°C. the formation of enstatite ($MgO.SiO_2$) begins and increases with the rise of temperature. The formation of SiO_2 with forsterite has been confirmed by chemical method—B. K. Banerjee, R. S. Dubey & N. Biswas.

CLRI, MADRAS

Hide Bacteria—Effect of sodium pentachlorophenate and 'Prentol' on the bacteria found in hides has been investigated. Both the antiseptics at 0.01 per cent concentration kill non-sporing bacteria but the sporing bacteria are not killed even with 0.1 per cent antiseptics. In the case of sodium pentachlorophenate (0.1 per cent) sporing bacteria do not develop even in presence of hide, but 'Prentol' (0.1 per cent) does not effect the growth of becteria.

CLRI Curing Salt—Suitability of the curing salt (developed and produced at the Institute) for storage of skins is being examined in collaboration with the British Leather Manufacturers Research Association. Skins cured with CLRI salt when tanned and finished as glace kid compare favourably with similar leather produced from skins cured with *khari* salt.

NAL, BANGALORE

Air Storage System—Design of a compressed air storage system required for studies in the fields of high speed aerodynamics and propulsion has been completed and detailed specifications drawn up. The system (850 tons, essentially consists of four cylindrical receivers each of 12 ft. dia. made of mild steel plate of thickness 1-$\frac{1}{8}$ in. Each receiver is supported on saddle supports mounted on rollers. It has a nominal length of 225 ft. and overall capacity of 100,000 ft. Temperature stabilization of the compressed air during a blowdown is achieved by using a 75 tons tubular matrix stacked at the exit ends of the inner pair of receivers. The outer pair of receivers can be disconnected from the inner pair by means of isolating valves.

* * *

The news item on 'Low-carbon Ferrochrome' pretaining to NML, Jamshedpur, published in *CSIR News*, Vol. 10, No. 21, p. 3 should read as follows:

Low-carbon Ferrochrome—Low-carbon ferrochrome, containing 65-75 per cent chromium and less than 1 per cent carbon is generally produced in a series of steps using a number of arc furnaces.

In the course of investigations carried out at the Laboratory for the production of low-carbon ferrochrome from high-carbon ferrochrome a process for the production of low-carbon chrome silicide (an intermediate product) has been developed. The process consists in the addition of ferro silicon to molten high-carbon ferrochrome. It has been observed that the reversal of the process, i.e. addition of molten high-carbon ferrochrome to molten ferro silicon is very violent and uncontrollable.

The chrome silicide so obtained has been used for desiliconization studies for the production of standard grade low-carbon ferrochrome. Requisite quantities of chrome ore and limestone are mixed and heated in an indirect arc furnace and when a fused mass is obtained, chrome silicide is gradually charged resulting in the desiliconization and production of a standard grade low-carbon ferrochrome.

Research Papers

Adaptation of the bitartrate method for the estimation of potassium in sea bittern—B. K. Shukla & D. J. Mehta, CSRI, Bhavnagar. *Z. anal. Chem.*, **176** (1960), 355-59.

Minor constituents of sea water—A. N. Kappanna, G. T. Gadre, H. M. Bhavnagary & J. M. Joshi, CSRI, Bhavnagar. *Curr. Sci.*, **29** (1960), 271-72.

Smilagenone and epi-smilagenin from *Dioscorea* saponin—D. C. Chakravarti, R. N. Chakravarti & M. N. Mitra, School of Tropical Medicine, Calcutta. *Nature, Lond*, **186** (1960), 236-37.

Studies in immunochemistry of V. choleræ Part III: Characterisation of polysaccharides isolated from broth cultures—S.B. Misra & D.L. Shrivastava, CDRI, Lucknow. *Indian J. med. Res.*, **48** (1960), 683-691.

Fractional gastric analysis in Vitiligo—R.C. Shukla & B. Mukerji, CDRI, Lucknow, *Indian J. med. Res.*, **48** (1960) 714-719.

Hookah smoking with special reference to adulteration of tobacco with Rahu dust—S.P. Paul & B. Mukerji, CDRI, Lucknow. *Indian Tobacco*, 10 (1960) 247-51.

Research Fellowships

The following have been awarded CSIR Fellowships for research on the schemes noted against their names :

Senior Fellowships :

1. Shri S.K. Salujha—*Palaeobotanical investigation of Indian coals* (Birbal Sahni Institute of Palaeobotany, Lucknow).

2. Shri Ardaman Singh—*Plastic theory as applied to steel structures* (Roorkee University, Roorkee).

Junior Fellowships :

1. Shri R.N. Mani—*Electrochemical approach to some aspects of structural chemistry of synthetic polymers* (University of Delhi, Delhi).

2. Shri Amalendu Kumar Gayen—*Studies on the biosynthesis of fats* (University College of Science & Technology, Calcutta).

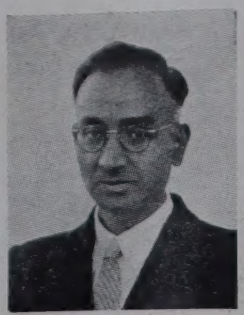
3. Shri A.I. Md. Sheriff—*Photosensitized polymerization of vinyl monomers in aqueous solution* (University of Madras, Madras).

4. Shri A.K. Sen Gupta—*Chemical and analytical studies on air pollution in Calcutta* (University College of Science & Technology, Calcutta).

5. Shri Hari Kishan Gakhar—*Synthetic perfumes* (Panjab University, Chandigarh).

Dr. K. N. Sinha

Dr. K.N. Sinha has been appointed Officer-on-Special Duty, CMRS, Dhanbad, with effect from Nov. 15, 1960. Since his joining the Institute he has been exercising all the powers of the Director, CMRS.



Dr. Sinha (*b.* 1916, Srinagar, Bihar) after obtaining his B.Sc. degree from the Patna University in 1935 and First Class Diploma in Mining Engineering of Associateship of Indian School of Mines in 1939, qualified for Mine Surveyors' Certificate of Competency (1940) and First Class Mine Managers' Certificate of Competency (1942) of Government of India. After a few years of service in the Government of Bihar and as Colliery Manager, he proceeded (1946) for mining research at Leeds University and got his Ph.D. degree. During his stay abroad he visited mines and mining research centres in U. K., France, Belgium, Holland, Germany, Poland and Czechoslavakia. On his return to India, he joined (1950) Coalfield Organization of M/s *Andrew Yule & Co. Ltd,* as Research Mining Engineer and had been working there till he joined CMRS.

Dr. Sinha's specialized field of study is mine ventilation, gas, explosives, fire, coal dust, mine drainage, instrumentation and stowing operations, with particular reference to safety, efficiency and economy in mines. He has to his credit thirty research papers and is the recepient of several honours for his publications. He is the first Indian to have been awarded (1950) the Government of India Prize and the Gold Medal of the Mining, Geological & Metallurgical Institute of India. He has also been awarded Silver and Bronze medals by Mining, Geological & Metallurgical Institute of India in 1959 and 1953 for his research papers.

He is the Vice-President of Mining, Geological and Metallurgical Institute of India, a member of Institution of Mining Engineers, London, and a member of Executive Council of National Association of Colliery Managers' and the Engineering Division Council of the Indian Standards Institution.

CSIR Patents during 1960

Researches carried out in the national laboratories and under CSIR sponsored research schemes and projects have resulted in the filing of 52 patent applications during 1960. Of these 43 patents are by national laboratories. Out of the total patent applications, 4 were filed in foreign countries (U. K., U. S. A., Australia and Germany).

The total number of patents accepted and sealed during the year was 55 and 41 respectively, the number of patents accepted and sealed in foreign countries was 4 and 5.

Manufacture of White Nubuck Leather

The Central Leather Research Institute is arranging the practical demonstration of the process (developed at the Institute) for the manufacture of White Chrome Nubuck Leather for the benefit of tanners. The White Nubuck Leather has a steady and growing demand for making shoe-uppers, sports-wear and ladies-wear.

The demonstration commences on January 16 and will continue till Feb. 15, 1961.

Organizations and industries who wish to send their representative for training may send their particulars to the Director, Central Leather Research Institute, Madras.

Research Scheme Terminated

The research scheme, *Fundamental studies on solvent extraction of coals,* Prof. S. R. Palit, Indian Association for the Cultivation of Science, Calcutta, has been terminated from Dec. 7, 1960.

PATENTS & PROCESSES

Applications Filed

INDIA

74356 : *Preparation of insoluble reaction products of polystyrene for use as cation-exchange materials*—K.P. Govindan & N.R. Krishnaswami, NCL, Poona.

U.S.A.

62522/1960 : *Improvements in or relating to the controlling of water evaporation for conserving water in lakes and reservoirs*—(Miss) S.B. Kulkarni, M.K. Gharpurey, N.R. Sanjana, A.V. Deo, K.O. Abraham & B.C. Subba Rao, NCL, Poona.

Applications Accepted

INDIA

66886 : *Improvements in or relating to bonding agents particularly suited for the manufacture of abrasive articles*—V. Nagarajan & R.T. Thampy, Shri Ram Institute for Industrial Research, Delhi.

67262 : *Production of anion-exchange material from coal*—J.N. Bhowmik. P.N. Mukherjee & A. Lahiri, CFRI, Jealgora.

68055 : *Improvements in or relating to complex mixtures of sulphides & polysulphides commonly known as oxidising salts*—O.P. Kulshreshtha & K.C. Srivastava, NPL, New Delhi.

U.K.

18282/59 : *A new process for the production of 4-hydroxycomarin and its derivatives*—V.R. Shah, J.L. Bose & R.C. Shah, NCL, Poona.

Processes Leased Out

The following processes have been leased out for commercial development :

1. Improved design for centrifugal pump, Indian Institute of Science, Bangalore (Indian Pat. No. 64168)—*Marshall (Direction) Private Ltd.*, Calcutta.

2. Enamels for textile bobbins, National Chemical Laboratory, Poona (Indian Pat. No. 53636)—*Eagle Paint & Pigment Industries Private Ltd*, Calcutta.

3. Manufacture of ethylene dichloride, Shri Ram Institute for Industrial Research, Delhi (Indian Pat. No. 51958)—*M/s Chika (P) Ltd.*, Bombay.

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R. N. 4212/5

CSIR NEWS

VOL. 11 NEW DELHI—JAN. 23, 1961 : MAGHA 2, 1882 No. 2

and organic fluxes) is being experimented in a pilot plant designed and fabricated at the Laboratory (*CSIR News*, Vol. 10, No. 6, p. 5).

Samples of aluminized wire sent to the British Iron & Steel Research Association, U. K. for detailed study of their structure and properties have been reported by the Association to be of exceptional quality and of very high standard. A salient feature of the product, as reported by Association, is that though a protective film instead of active flux is used in the process, no evidence of failure of alloy layer is noticed during extensive sampling of wires.

CFRI, JEALGORA

Oxidation of Low Boiling Tars in Fluidized Bed—Investigations have been in progress on the vapour phase oxidation of γ- and β-picolines (obtained from low boiling tars) for preparing nicotinic acid and isonicotinic acid using a fluidized bed of V_2O_5-K_2SO_4-Fe_2O_3-SiO_2 catalyst. Effect of varying space velocity of air, feed/catalyst ratio, and temperature on the yields of [illegible] context.

NML, JAMSHEDPUR — Dr. B.V. Keskar, Minister for Information & Broadcasting, being shown samples of aluminized steel wires during his visit to the laboratory by Dr. B.R. Nijhawan.

Conference & Meetings

A conference of Chairmen of Research Committees will be held in the Conference Room of the CSIR Secretariat, New Delhi, on Feb. 3, 1961 at 3.00 p.m. Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, will preside.

A meeting of the Essential Oils Research Committee will be held in the Conference Room of the CSIR Secretariat, New Delhi, on Feb. 4, 1961 at 11.00 a.m. Shri P.A. Narielwala, will preside.

A meeting of the Executive Council of the Regional Research Laboratory, Hyderabad, will be held at the Laboratory on Feb. 4, 1961 at 11.00 a.m. Shri S.B.P. Pattabhi Rama Rao, Minister for Education, Andhra Pradesh, will preside.

A meeting of the Executive Council of the National Chemical Laboratory, Poona, will be held at the Laboratory on Feb. 11, 1961 at 9.30 a.m. Shri P.A. Narielwala, will preside.

of refractories from Katni and Shevroy bauxites (without any additions) have shown that refractories suitable for use in industrial furnaces could be produced from bauxites alone after proper calcination above 1,500°C. and grinding to —60 mesh B.S. sieve particle [illegible]

The four-day symposium on 'Light Metal Industry in India' organized by the National Metallurgical Laboratory, Jamshedpur (*CSIR News*, Vol. 10, No. 17, p. 1) will be inaugurated by Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, on Feb. 14, 1961 at 10.30 a.m. in the Auditorium of the Laboratory. Shri J.J. Ghandy, Chairman, Executive Council of the Laboratory will preside.

A large number of scientific and technical contributions relating to light metal industry, received from leading metallurgists and scientists in India and abroad will be presented and discussed at the symposium.

Organizations interested in sending their representatives for participation in the symposium may send the particulars of delegates in the prescribed forms available from the Director, National Metallurgical Laboratory, Jamshedpur.

m.p.h.; stalling speed, 307 m.p.h.; sinking speed, 4.2 ft/s. at a forward speed of 60 m.p.h.—W. REPENTHIN, N. N. BHATT & A. S. ANANTHAPADMANABHAM, Madras Institute of Technology, Madras.

[illegible]

●DRS. P. H. BHANGLE and K. P. BISWAS have joined CFRI, Jealgora, as Pool Officers with effect from Sept. 8, 1960 and Nov. 1, 1960 respectively.

●DRS. A.B. SEN, M.C. KHOSLA, B.S. BISHT and SHRI PREM SAGAR have been appointed, on promotion, Junior Scientific Officers, CDRI, Lucknow, with effect from Nov. 25, 1960.

●DR. U.G. NAYAK, Junior Scientific Officer, NCL, Poona, relinquished charge of his post from Jan. 9, 1961.

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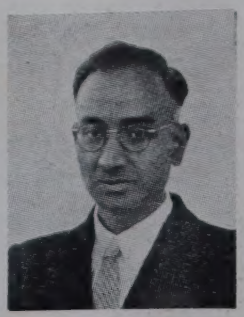
●SHRI K. KASHYAP, Asst. Editor, Publications Directorate, CSIR, New Delhi, after completion of his training in Botanical Nomenclature of Indian Economic Plants at the Royal Botanic Gardens, Kew (U.K.) returned and resumed duties with effect from Sept. 27, 1960. He was elected a Fellow of the Linnean Society, London.

(*Contd. on p. 2, col. 2*)

BRIEFS

Seminar in Electrochemistry

A four-day seminar in Electrochemistry organized by the Central Electrochemical Research Institute, Karaikudi, concluded on Dec. 20, 1960. Prof. M.S. Thacker, Director-General Scientific [illegible], Srinagar, Bihar) after obtaining his B.Sc. degree from the Patna University in 1935 and First Class Diploma in Mining Engineering of Associateship of Indian School of Mines in 1939, qualified for Mine Surveyors' Certificate of Competency (1940) and First Class Mine Managers' Certificate of Competency (1942) of Government of India. After a few years of service in the Government of Bihar and as Colliery Manager, he proceeded (1946) for mining research at Leeds University and got his Ph.D. degree. During his stay abroad he visited mines and mining research centres in U. K., France, Belgium, Holland, Germany, Poland and Czechoslavakia. On his return to India, he joined (1950) Coalfield Organization of M/s *Andrew Yule & Co. Ltd*, as Research Mining Engineer.



on the manufacture of windmills and wind electric generators and gives a brief account of wind surveys and collection of wind data. Specifications of two windmills designed by the Wind Power Sub-Committee are also appended with the report.

CBRI Open Days

January 5 & 7, 1961 were declared 'Open Days' by the Central Building Research Institute, Roorkee. More than 3,000 visitors including the scientists who were present in Roorkee as delegates to Indian Science Congress visited the Institute. They were shown round the museum and various laboratories and field sections of the Institute.

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The Central Building Research Institute, Roorkee has been recognized as a centre for carrying out research for Ph. D. degree by the Banaras Hindu University and the University of Roorkee.

Researches carried out in the national laboratories and under CSIR sponsored research schemes and projects have resulted in the filing of 52 patent applications during 1960. Of these 43 patents are by national laboratories. Out of the total patent applications, 4 were filed in foreign countries (U. K., U. S. A., Australia and Germany).

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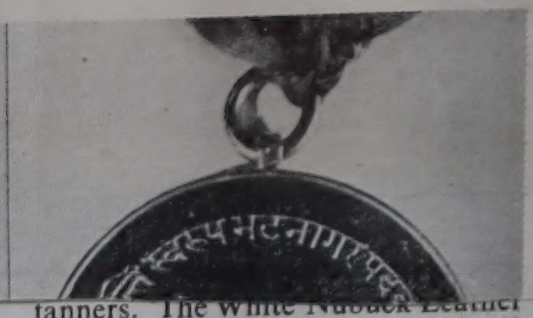

tanners. The White Nubuck Leather has a steady and growing demand for making shoe-uppers, sports-wear and ladies-wear.

The demonstration commences on January 16 and will continue till Feb. 15, 1961.

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Research Scheme Terminated

The research scheme, *Fundamental studies on solvent extraction of coals*, Prof. S. R. Palit, Indian Association for the Cultivation of Science, Calcutta, has been terminated from Dec. 7, 1960.

PATENTS & PROCESSES

Applications Filed

INDIA

74356 : *Preparation of insoluble reaction products of polystyrene for use as cation-exchange materials*—Medicinal Plants [illegible] Krishna-

Council of Agricultural Research to formulate proposals for future programme of work on medicinal plants.

●The following have been nominated members of the Committee/Panel of the Indian Standards Institution :

DR. ATMA RAM, Director (Chairman) and SHRI R.V. LELE, Senior Scientific Officer (Alternate Member) CGCRI, Calcutta—*Ceramic-ware Sectional Committee.*

DR. M.N. RAMASWAMI, Asst. Director (Principal Member), CIMPO Zonal Office, Bangalore and SHRI B.C. GULATI, Senior Scientific Officer (Alternate Member), CIMPO, New Delhi—*Essential Oils and Allied Products Sectional Committee.*

SHRI A.N. BASU, Asst. Director, CFRI, Jealgora—*Liquified Petroleum Gases Sub-Committee.*

DR. N.L. LAHIRY, Asst. Director, CFTRI, Mysore—*Fish and Fish Products Sub-Committee* (Convener).

& polysulphides commonly known as oxidising salts—O.P. Kulshreshtha & K.C. Srivastava, NPL, New Delhi.

U.K.

Fruits and Vegetables Sub-Committee.

* * *

●DR. E.K. JANAKI AMMAL, Officer-on-Special Duty, RRL, Assam, (working at RRL, Jammu), has been awarded the *Birbal Sahni Medal for 1960* by the Indian Botanical Society at a ceremony held at Roorkee (during the Indian Science Congress Session) on Jan. 5, 1961.

●SHRI K.Y. SHRIKHANDE, Senior Scientific Officer, CFRI, Jealgora, has been awarded Ph.D. degree in Fuel Technology by the Banaras Hindu University for his thesis : *Some Studies on Fluidized Beds.*

●SHRI B.D. SHARMA, Ex-Research Fellow, CSIR research scheme (Investigator-in Charge: Dr. P.G. Deo, Panjab Engineering College, Chandigarh) has been awarded Ph.D. degree in Physics by the Panjab University for his thesis: *Studies of some Structure Sensitive Characteristics of Solids (metals & alloys) using Recent Optical Techniques.*

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Aluminizing of Steel Wires—Production of aluminized mild steel wires by hot-dip method using different fluxes (molten salt, aqueous and organic fluxes) is being experimented in a pilot plant designed and fabricated at the Laboratory (*CSIR News*, Vol. 10, No. 6, p. 5).

Samples of aluminized wire sent to the British Iron & Steel Research Association, U. K. for detailed study of their structure and properties have been reported by the Association to be of exceptional quality and of very high standard. A salient feature of the product, as reported by Association, is that though a protective film instead of active flux is used in the process, no evidence of failure of alloy layer is noticed during extensive sampling of wires.

NML, JAMSHEDPUR — Dr. B.V. Keskar, Minister for Information & Broadcasting, being shown samples of aluminized steel wires during his visit to the laboratory by Dr. B.R. Nijhawan.

CFRI, JEALGORA

Oxidation of Low Boiling Tars in Fluidized Bed—Investigations have been in progress on the vapour phase oxidation of γ- and β-picolines (obtained from low boiling tars) for preparing nicotinic acid and isonicotinic acid using a fluidized bed of V_2O_5-K_2SO_4-Fe_2O_3-SiO_2 catalyst. Effect of varying space velocity of air, feed/catalyst ratio, and temperature on the yields of both the products has been studied.

With γ-picoline, a 28.6 per cent of the theoretical yield of isonicotinic acid is obtained, the unconverted base being largely recoverable for reuse in oxidation. With β-picoline, the yield of nicotinic acid is 25.2 per cent. Under identical conditions the oxidation of β-picoline starts at 430°C., the maximum conversion taking place in the range 450°-470°C., but in the case of γ-picoline, the temperature of initial oxidation is 350°C. and the range of temperature for getting maximum yield is 370°-410°C.

Nicotinic and isonicotinic acids are the starting materials for the synthesis of a number of important chemicals used in pharmaceutical industry—S. ROY, P. K. BANERJEE & A. N. BASU.

CGCRI, CALCUTTA

Bauxite Refractories—Investigations carried out for the preparation of refractories from Katni and Shevroy bauxites (without any additions) have shown that refractories suitable for use in industrial furnaces could be produced from bauxites alone after proper calcination above 1,500°C. and grinding to —60 mesh B.S. sieve particle size. The refractories should be formed at high pressure and fired above 1,600°C.

CDRI, LUCKNOW

Oral Contraceptives — Further studies on oral contraceptives (*CSIR News*, Vol. 10, No. 15, p.3) have indicated that a single injection of cadmium chloride directly into the testis at the rate of 10-20 μ g./100 g. body weight totally destroys the semeniferous epithelium in male rats.

Another compound (KI/End 2) synthesized at the Institute has also shown some promise.

Sponsored Research

Two-Seater Sailplane—Designing and construction of an all-wood two-seater sailplane have been in progress. Studies carried out so far have resulted in the construction of a two seator sailplane with following estimated performance : Best glide ratio, 25:1 at 36 m.p.h.; minimum sinking speed, 2.0 ft/s. at 32 m.p.h.; stalling speed, 307 m.p.h.; sinking speed, 4.2 ft/s. at a forward speed of 60 m.p.h.—W. REPENTHIN, N. N. BHATT & A. S. ANANTHAPADMANABHAM, Madras Institute of Technology, Madras.

Vegetable Oil Based Plasticizers—Investigations have been in progress for producing plasticizers from vegetable oils and fatty acids for use in polyvinyl chloride resins.

As a first step towards the synthesis of such plasticizers, a process for preparing concentrated monoglycerides from vegetable oils and glycerine utilizing a fugitive catalyst has been developed. The salient features of the process are (i) it gives monoglycerides of high purity (80-90 per cent) as against the normal 40-50 per cent obtained with the conventional methods; (ii) the product is of lighter colour, free from undesirable odour and of low fatty acid content; (iii) the unreacted chemicals can be removed unharmed at the end of the reaction and can be reused; (iv) the catalyst can be readily removed at the end of the reaction and reversion of monoglycerides during the latter stages of cooling or during subsequent heating in

course of their utilization is avoided; and (v) commercial grade alcohols containing 2-5 per cent water can be used in the process and the use of anhydrous reagents and maintenance of absolutely dry conditions are not necessary.

Conditions for the acetylation of monoglycerides to produce acetoglycerides have been standardized. Samples of acetoglycerides produced have been found to show good compatibility with polyvinyl chloride resins—R. K. BHATNAGAR & R. K. KOCHHAR, Shri Ram Institute for Industrial Research, Delhi.

Urease from Cajanus cajan—Studies have been carried out for the preparation of urease from *Cajanus cajan* (*Arhar*).

Urease, prepared by precipitating the aqueous extract of *C. cajan* with acetone, lost 11.8 per cent of its activity when stored in a refrigerator for 6 months. It showed maximum activity at about 0.3M concentration of the substrate. For the preparation of 20 g. of urease powder, 1,000 g. of powdered *arhar dahl* and 1,500 ml. of acetone are required. Tablets (200 mg.) of urease prepared from powder have been found to be about ten times more active than the B.D.H. urease tablets. These can be efficiently used for the estimation of blood urea-nitrogen. These tablets are superior to B.H.D. tablets as they give a homogeneous suspension with a much slower rate of turbidity formation after nesslerization—R.L. NATH & T.K. PRADHAN, School of Tropical Medicine, Calcutta.

Research Papers

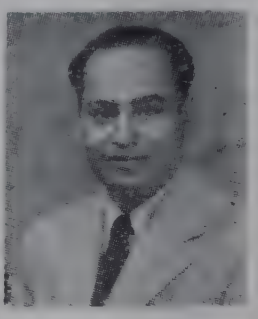
Studies on the blending of coals for the production of metallurgical coke—J. Bandopadhyay, T. C. Tarafdar, N.N. Das Gupta & A. Lahiri, CFRI, Jealgora. *J. Inst. Fuel*, 33 (1960), 592-97.

Microscopic studies of metallurgical coke—S. Banerjee, T. N. Basu & N.N. Das Gupta, CFRI, Jealgora. *J. Mines Metals Fuels*, 8 (11) (1960), 3-9.

A pilot plant for high temperature carbonization of coals—N.N. Das Gupta, K.Y. Shrikhande & V.V. Rao, CFRI, Jealgora. *Coke Oven Managers' Year Book, U.K.*, 1960, 438-64.

Dr. N.G. Basak

Dr. N.G. Basak has been appointed, on promotion, Deputy Director, CFRI, Jealgora, with effect from Dec. 26, 1960.



Dr. Basak (*b.* 1913 at Dacca) after obtaining first class M.Sc. degree in Physical Chemistry from Dacca University (1937) worked as a Research Scholar at the University (1938-40) and then at the Indian Institute of Science, Bangalore (1940-42) under the guidance of late Dr. J.C. Ghosh. He worked as Research Chemist (1942-45) at the High Explosives Factory, Kirkee and then went back to the Indian Institute of Science for carrying out research (1945-48) under the Industrial Catalyst Scheme sponsored by the CSIR. At Bangalore he conducted research on high pressure technical gas reactions with special reference to production of synthetic oils, and synthesis of methanol. He got his D. Phil. degree from the Calcutta University in 1952.

Dr. Basak joined the CFRI as Senior Scientific Officer in 1948. In 1953, he was promoted to the post of Assistant Director. He was associated with the planning and development of the Institute.

Dr. Basak has considerable research experience in physical chemistry and in problems of fuel technology, particularly in high pressure catalytic gas reactions. He has developed new low-pressure refining techniques specially suited for the production of diesel oil from high boiling fractions of natural petroleum and low-temperature tar. He has also worked out a number of new techniques for the production of chemicals from coal and tar. He has 9 patents to his credit and is the author of about 60 papers.

Dr. Basak visited U.K., France and other European countries under a United Nations Fellowship (1952) to study the economic development of fuels and also visited the U.S.A. (1956) under a TCM Fellowship for studying the production of synthetic oil, including gasification of coal.

Processes Ready for Exploitation

LATEX CEMENT

The Central Leather Research Institute, Madras, has developed a process (Indian Pat. No. 6629) for the manufacture of latex-based leather adhesive from indigenously available raw materials (rubber latex, casein, ammonia, formalin and a water-soluble dye) which may used in place of imported latex cement. Conditions for manufacturing the adhesive on a pilot plant scale (5 gal. per batch) have been standardized. The product has been found to give satisfactory performance in footwear manufacture.

The plant and equipment required for large scale manufacture are easily available. Its production can be undertaken as a subsidiary venture in an industrial establishment having boiler facilities and electrical power. A unit with a capacity of 30 gal. per day is estimated to require a total capital outlay of Rs. 25,000. A smaller unit (capacity 10 gal. per day) may be set up in about Rs. 10,000.

MALTED MILK POWDER

The Central Food Technological Research Institute, Mysore, has developed an improved process for the manufacture of malted milk powder and allied products utilizing indigenously available raw materials (Jowar, barley, wheat, ragi and milk). The product compares (in taste and flavour) favourably with similar imported materials. The process consists in mixing concentrated malt extract with milk powder, fats and carbohydrate and drying the mass in vacuum drier. The dried mass is powdered and packed in containers.

The product has been successfully produced on a bench scale unit in 50 lb. batches. The shelf life of the product at 37°C. is about one year.

Total capital outlay for a plant having a capacity of 300 tons per annum is estimated at about Rs. 6.05 lakhs. The major equipments required are vacuum shelf driers, powder filling unit, mixers, seamers and granulator.

Parties interested in taking up the commercial development of the above processes may correspond with the Secretary, National Research Development Corporation, Mandi House, New Delhi-1.

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CSIR NEWS

VOL. 11 NEW DELHI—FEB. 13, 1961 : MAGHA 24, 1882 No. 3

MEETINGS

A meeting of the *Geological & Mineralogical Research Committee* will be held in the Conference Room of the CSIR Secretariat, New Delhi, on Feb. 18, 1961 at 10.30 a.m. Dr D N. Wadia, Geological Advisor, Department of Atomic Energy, New Delhi, will preside.

A meeting of the *Biological Research Committee* will be held in the Conference Room of the CSIR Secretariat, New Delhi, on Feb. 20, 1961 at 10.00 a.m. Prof. P. Maheshwari, Head of the Department of Botany, Delhi University, will preside.

The meeting of the *Executive Council, Regional Research Laboratory, Hyderabad* (*CSIR News*, Vol. 11, No. 2, p. 1) will be held in the Laboratory on Feb. 28, 1961 at 5.15 p.m. Shri S.B.P. Pattabhirama Rao, Minister for Education, Government of Andhra Pradesh, will preside.

PERSONAL

● DR S.V. GANAPATI, Officer-on-Special Duty, CPHERI, Nagpur, has been appointed Officer-in-charge, Ahmedabad Field Centre, with effect from Feb. 2, 1961.

● SHRI A.P. JAIN, Section Officer, CSIR Secretariat, New Delhi, has been appointed, on promotion, Administrative Officer, CPHERI, Nagpur, with effect from Feb. 1, 1961.

● SHRI S.P. GUJRAL has been appointed, on promotion, Asst. Editor, National Register Unit, CSIR, New Delhi, with effect from Jan. 18, 1961.

● DR N.N. SHARMA has been appointed, on promotion, Senior Scientific Officer : Grade II, CPHERI, Nagpur, with effect from Jan. 24, 1961.

● SHRI R.P. MISRA has been appointed, on promotion, Junior Scientific Officer, CPHERI, Nagpur with effect from Jan. 24, 1961.

● SHRI C.A. TANEJA, Junior Scientific Officer, CBRI, Roorkee, after completion of his training in Portland Cement and Clinkers at the laboratories of Cement and Concrete Association, Slough (U.K.), under the Colombo Plan, returned and resumed duty with effect from Nov. 8, 1960.

● DR GOVIND RAI CHAUDHRY, Junior Scientific Officer, NBG, Lucknow, after completion of his training under the Colombo Plan at the Oxford University in Modern Techniques in Organic Chemistry with special reference to Natural Products, returned to India and resumed duty with effect from Dec. 9, 1960. He has been awarded the D. Phil. degree for his thesis, *The Chemistry of Cucurbitacins and Allied Natural Products.*

● SHRI C.M. DESHAPRABHU, Junior Scientific Assistant, CGCRI, Calcutta, after completion of his training in France in Documentation and Scientific Information Services returned and resumed duty with effect from Dec. 14, 1960.

* * *

● DR J.C. RAY, Director, IIBEM, Calcutta, has been nominated a member of the State Advisory Board for Haffkine Institute, Bombay, by the Government of Maharashtra.

● DR RAM PRASAD, Asst. Director, NPL, New Delhi, has been nominated a member of the Railway Safety Devices Advisory Council, Ministry of Transport and Communications.

● The following officers have been nominated members of the Committee/Panel of the Indian Standards Institution :

SHRI G.D. JOGLEKAR, Asst. Director, NPL, New Delhi—*Rotating Machinery Sectional Committee.*

SHRI M.R. VERMA, Senior Scientific Officer, NPL, New Delhi—*Chemical Standards Sectional Committee* and *Water Sectional Committee.*

DR M.L. KHANNA, Senior Scientific Officer, NPL, New Delhi—*Sub-Committee for Introduction of Metric System in Indian Standards.*

MAJ. N.V.R. IYENGAR, Senior Scientific Officer, CFTRI, Mysore—*Packaging, Storage and Transport of Fruits and Vegetables Sub-Committee.*

SHRI A.N. KUMAR, Senior Scientific Officer, NAL, Bangalore—*Methods of Physical Tests Sectional Committee.*

CGCRI, CALCUTTA—Dr. K.A. Hamied, Member, Governing Body, CSIR, examining samples of mica paints developed at the Institute

BRIEFS

CPHERI Foundation Stone

Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, laid the Foundation Stone of the main laboratories of the Central Public Health Engineering Research Institute, at a site on Jawaharlal Nehru Marg, Nagpur, on Jan. 18, 1961.

Prof. Thacker Inaugurates Water Softening Plant

A pilot plant for softening of hard water at Khaperkheda Thermal Power Station of the Maharashtra State Electricity Board was inaugurated by Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, on Jan. 18, 1961. The plant has a capacity of producing 25,000 gal. of water (less than 10 p.p.m. hardness) per regeneration.

The plant has been designed on the basis of laboratory experiments carried out at the Central Public Health Engineering Research Institute, Nagpur. The cation exchange resin used in the plant was developed at the National Chemical Laboratory, Poona, from cashewnut shell liquid.

The cost of this plant, inclusive of civil works, is about Rs. 15,000. An imported plant of similar capacity is expected to cost about Rs. 1.5 lakhs.

CMC Process Goes to Production

A commercial scale plant for the manufacture of carboxymethyl cellulose (CMC) set up by *Sardesai Bros Ltd* at Bilimora was inaugurated by Shri Manubhai Shah, Minister of Industries, on Jan. 22, 1961. The process for the manufacture of CMC was developed under a research scheme sponsored by the CSIR at the Shri Ram Institute for Industrial Research, Delhi and the pilot plant and development work was carried out at Bilimora. The process mainly consists in reacting soda cellulose and monochloracetic acid in alcohol medium. Various grades of CMC have been produced in the pilot plant and samples have been tested for different applications with satisfactory results.

The cost of production of CMC has been estimated at Rs. 2.19 per lb. as compared to Rs. 5.44 per lb. of imported product.

CMC is a versatile chemical useful in industries requiring a hydrophilic colloid possessing marked suspending, thickening, stabilizing and film forming properties. It is largely in use in textile, paper, paint, leather, pharmaceutical, soap and detergent industries. It is also used in petroleum oil drilling.

Symposium on Load Bearing Capacity of Soils

A symposium on Load Bearing Capacity of Soils was held at Vigyan Bhavan, New Delhi during Jan. 23-24, 1961 under the joint auspices of the Central Building Research Institute, Roorkee, and the National Building Organization, New Delhi.

Shri K.C. Reddy, Union Minister for Works, Housing and Supply, inaugurated the symposium. In his inaugural address, he laid great stress on the necessity for modern engineers to be fully conversant with the advances in soil mechanics and foundation engineering to design more economical and safe foundations.

About 150 delegates from various institutions in India and three Russian experts in soil mechanics, Ms I.M. Litvinov, K.V. Yegorov and E. Volkov, attended the symposium.

Thirty-eight papers received from scientists and engineers from India and abroad (U.K., U.S.A., France, Rumania, Japan and Israel) were presented and discussed in the following four technical sessions: Field load bearing tests and their interpretations; laboratory bearing capacity tests and their interpretation, settlements, their estimation, permissible allowance, etc.; pile foundations; and theories on bearing capacity and design of foundations.

Kayar Udyog

A Hindi version of the publication, Coir: Its Extraction, Properties & Uses (*CSIR News*, Vol. 10, No. 19, p. 2) has been brought out.

Copies of the publication (Price, Rs 4) are available from the Publications Directorate, CSIR, New Delhi-1.

* * *

The news item pertaining to Shri Ajoy Kumar Ganguly which appeared in *CSIR News*, Vol. 10, No. 24, p. 2 should read as follows:

SHRI AJOY KUMAR GANGULY joined as Junior Research Fellow in the scheme, *Mechanism of vulcanisation of rubber*, Indian Association for the Cultivation of Science, Calcutta, with effect from Nov. 1, 1960.

* * *

Consequent on Dr C.V. Suryanarayana being appointed Head of the Department of Chemistry, University of Mysore, the following research schemes have been transferred from the Annamalai University to the Mysore University, Mysore: (1) Electrical conductance and viscosity of electrolyte solutions in a wide range of concentration; and (2) dielectric constants in relation to liquid miscibility.

CBRI, ROORKEE—The Russian delegates to the symposium on Load Bearing Capacity of Soils at the Soil Engineering Division

RESEARCH IN PROGRESS

National Laboratories

CFRI, JEALGORA

X-ray Study of Indian Asbestos—Samples of chrysotile (an important variety of asbestos indigenous to India) obtained from Cuddapah, South India, have been examined by X-ray using copper Kα-radiation.

The original samples have been found to contain chrysotile ($3MgO.2SiO_2 2H_2O$) as the major phase and calcite ($CaCO_3$) as minor phase with big particle size of its (calcite) chrystallites. On heating the samples up to 650°C., transformation of chrysotile to forsterite($2MgO.SiO_2$) starts and completes at about 800°C. At 1000°C. the formation of enstatite ($MgO.SiO_2$) begins and increases with the rise of temperature. The formation of SiO_2 with forsterite has been confirmed by chemical method—B. K. Banerjee, R. S. Dubey & N. Biswas.

CLRI, MADRAS

Hide Bacteria—Effect of sodium pentachlorophenate and 'Prentol' on the bacteria found in hides has been investigated. Both the antiseptics at 0.01 per cent concentration kill non-sporing bacteria but the sporing bacteria are not killed even with 0.1 per cent antiseptics. In the case of sodium pentachlorophenate (0.1 per cent) sporing bacteria do not develop even in presence of hide, but 'Prentol' (0.1 per cent) does not effect the growth of becteria.

CLRI Curing Salt—Suitability of the curing salt (developed and produced at the Institute) for storage of skins is being examined in collaboration with the British Leather Manufacturers Research Association. Skins cured with CLRI salt when tanned and finished as glace kid compare favourably with similar leather produced from skins cured with *khari* salt.

NAL, BANGALORE

Air Storage System—Design of a compressed air storage system required for studies in the fields of high speed aerodynamics and propulsion has been completed and detailed specifications drawn up. The system (850 tons, essentially consists of four cylindrical receivers each of 12 ft. dia. made of mild steel plate of thickness 1-$\frac{1}{8}$ in. Each receiver is supported on saddle supports mounted on rollers. It has a nominal length of 225 ft. and overall capacity of 100,000 ft. Temperature stabilization of the compressed air during a blowdown is achieved by using a 75 tons tubular matrix stacked at the exit ends of the inner pair of receivers. The outer pair of receivers can be disconnected from the inner pair by means of isolating valves.

* * *

The news item on 'Low-carbon Ferrochrome' pretaining to NML, Jamshedpur, published in *CSIR News*, Vol. 10, No. 21, p. 3 should read as follows:

Low-carbon Ferrochrome—Low-carbon ferrochrome, containing 65-75 per cent chromium and less than 1 per cent carbon is generally produced in a series of steps using a number of arc furnaces.

In the course of investigations carried out at the Laboratory for the production of low-carbon ferrochrome from high-carbon ferrochrome a process for the production of low-carbon chrome silicide (an intermediate product) has been developed. The process consists in the addition of ferro silicon to molten high-carbon ferrochrome. It has been observed that the reversal of the process, i.e. addition of molten high-carbon ferrochrome to molten ferro silicon is very violent and uncontrollable.

The chrome silicide so obtained has been used for desiliconization studies for the production of standard grade low-carbon ferrochrome. Requisite quantities of chrome ore and limestone are mixed and heated in an indirect arc furnace and when a fused mass is obtained, chrome silicide is gradually charged resulting in the desiliconization and production of a standard grade low-carbon ferrochrome.

Research Papers

Adaptation of the bitartrate method for the estimation of potassium in sea bittern—B. K. Shukla & D. J. Mehta, CSRI, Bhavnagar. *Z. anal. Chem.*, **176** (1960), 355-59.

Minor constituents of sea water—A. N. Kappanna, G. T. Gadre, H. M. Bhavnagary & J. M. Joshi, CSRI, Bhavnagar. *Curr. Sci.*, **29** (1960), 271-72.

Smilagenone and epi-smilagenin from *Dioscorea* saponin—D. C. Chakravarti, R. N. Chakravarti & M. N. Mitra, School of Tropical Medicine, Calcutta. *Nature, Lond*, **186** (1960), 236-37.

Studies in immunochemistry of V. choleræ Part III: Characterisation of polysaccharides isolated from broth cultures—S.B. Misra & D.L. Shrivastava, CDRI, Lucknow. *Indian J. med. Res.*, **48** (1960), 683-691.

Fractional gastric analysis in Vitiligo—R.C. Shukla & B. Mukerji, CDRI, Lucknow, *Indian J. med. Res.*, **48** (1960) 714-719.

Hookah smoking with special reference to adulteration of tobacco with Rahu dust—S.P. Paul & B. Mukerji, CDRI, Lucknow. *Indian Tobacco*, 10 (1960) 247-51.

Research Fellowships

The following have been awarded CSIR Fellowships for research on the schemes noted against their names :

Senior Fellowships :

1. SHRI S.K. SALUJHA—*Palaeobotanical investigation of Indian coals* (Birbal Sahni Institute of Palaeobotany, Lucknow).

2. SHRI ARDAMAN SINGH—*Plastic theory as applied to steel structures* (Roorkee University, Roorkee).

Junior Fellowships :

1. SHRI R.N. MANI—*Electrochemical approach to some aspects of structural chemistry of synthetic polymers* (University of Delhi, Delhi).

2. SHRI AMALENDU KUMAR GAYEN—*Studies on the biosynthesis of fats* (University College of Science & Technology, Calcutta).

3. SHRI A.I. MD. SHERIFF—*Photosensitized polymerization of vinyl monomers in aqueous solution* (University of Madras, Madras).

4. SHRI A.K. SEN GUPTA—*Chemical and analytical studies on air pollution in Calcutta* (University College of Science & Technology, Calcutta).

5. SHRI HARI KISHAN GAKHAR—*Synthetic perfumes* (Panjab University, Chandigarh).

Dr. K. N. Sinha

Dr. K.N. Sinha has been appointed Officer-on-Special Duty, CMRS, Dhanbad, with effect from Nov. 15, 1960. Since his joining the Institute he has been exercising all the powers of the Director, CMRS.

Dr. Sinha (*b.* 1916, Srinagar, Bihar) after obtaining his B.Sc. degree from the Patna University in 1935 and First Class Diploma in Mining Engineering of Associateship of Indian School of Mines in 1939, qualified for Mine Surveyors' Certificate of Competency (1940) and First Class Mine Managers' Certificate of Competency (1942) of Government of India. After a few years of service in the Government of Bihar and as Colliery Manager, he proceeded (1946) for mining research at Leeds University and got his Ph.D. degree. During his stay abroad he visited mines and mining research centres in U. K., France, Belgium, Holland, Germany, Poland and Czechoslavakia. On his return to India, he joined (1950) Coalfield Organization of M/s *Andrew Yule & Co. Ltd*, as Research Mining Engineer and had been working there till he joined CMRS.

Dr. Sinha's specialized field of study is mine ventilation, gas, explosives, fire, coal dust, mine drainage, instrumentation and stowing operations, with particular reference to safety, efficiency and economy in mines. He has to his credit thirty research papers and is the recepient of several honours for his publications. He is the first Indian to have been awarded (1950) the Government of India Prize and the Gold Medal of the Mining, Geological & Metallurgical Institute of India. He has also been awarded Silver and Bronze medals by Mining, Geological & Metallurgical Institute of India in 1959 and 1953 for his research papers.

He is the Vice-President of Mining, Geological and Metallurgical Institute of India, a member of Institution of Mining Engineers, London, and a member of Executive Council of National Association of Colliery Managers' and the Engineering Division Council of the Indian Standards Institution.

CSIR Patents during 1960

Researches carried out in the national laboratories and under CSIR sponsored research schemes and projects have resulted in the filing of 52 patent applications during 1960. Of these 43 patents are by national laboratories. Out of the total patent applications, 4 were filed in foreign countries (U. K., U. S. A., Australia and Germany).

The total number of patents accepted and sealed during the year was 55 and 41 respectively, the number of patents accepted and sealed in foreign countries was 4 and 5.

Manufacture of White Nubuck Leather

The Central Leather Research Institute is arranging the practical demonstration of the process (developed at the Institute) for the manufacture of White Chrome Nubuck Leather for the benefit of tanners. The White Nubuck Leather has a steady and growing demand for making shoe-uppers, sports-wear and ladies-wear.

The demonstration commences on January 16 and will continue till Feb. 15, 1961.

Organizations and industries who wish to send their representative for training may send their particulars to the Director, Central Leather Research Institute, Madras.

Research Scheme Terminated

The research scheme, *Fundamental studies on solvent extraction of coals*, Prof. S. R. Palit, Indian Association for the Cultivation of Science, Calcutta, has been terminated from Dec. 7, 1960.

PATENTS & PROCESSES

Applications Filed

INDIA

74356 : *Preparation of insoluble reaction products of polystyrene for use as cation-exchange materials*—K.P. Govindan & N.R. Krishnaswami, NCL, Poona.

U.S.A.

62522/1960 : *Improvements in or relating to the controlling of water evaporation for conserving water in lakes and reservoirs*—(Miss) S.B. Kulkarni, M.K. Gharpurey, N.R. Sanjana, A.V. Deo, K.O. Abraham & B.C. Subba Rao, NCL, Poona.

Applications Accepted

INDIA

66886 : *Improvements in or relating to bonding agents particularly suited for the manufacture of abrasive articles*—V. Nagarajan & R.T. Thampy, Shri Ram Institute for Industrial Research, Delhi.

67262 : *Production of anion-exchange material from coal*—J.N. Bhowmik, P.N. Mukherjee & A. Lahiri, CFRI, Jealgora.

68055 : *Improvements in or relating to complex mixtures of sulphides & polysulphides commonly known as oxidising salts*—O.P. Kulshreshtha & K.C. Srivastava, NPL, New Delhi.

U.K.

18282/59 : *A new process for the production of 4-hydroxycomarin and its derivatives*—V.R. Shah, J.L. Bose & R.C. Shah, NCL, Poona.

Processes Leased Out

The following processes have been leased out for commercial development :

1. Improved design for centrifugal pump, Indian Institute of Science, Bangalore (Indian Pat. No. 64168)—*Marshall (Direction) Private Ltd.*, Calcutta.

2. Enamels for textile bobbins, National Chemical Laboratory, Poona (Indian Pat. No. 53636)—*Eagle Paint & Pigment Industries Private Ltd*, Calcutta.

3. Manufacture of ethylene dichloride, Shri Ram Institute for Industrial Research, Delhi (Indian Pat. No. 51958)—*M/s Chika (P) Ltd.*, Bombay.

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CSIR NEWS

VOL. II 17/1/61 NEW DELHI—JAN. 9, 1961 : PAUSA 19, 1882 No. 1

NCL Pilot Plant Laboratory Opened

Prof. M. S. Thacker, Director-General, Scientific & Industrial Research, opened the newly constructed pilot plant laboratory and workshop of the National Chemical Laboratory, Poona on Dec. 26, 1960. In his opening address, emphasising the role of science in the rapid developments of the country, Prof. Thacker exhorted the Indian scientists to go ahead and catch up with the great progress already achieved in other countries in the field of science and technology.

Prof. Thacker added that he was gratified to find that a number of processes developed at the Laboratory, are now being taken over by the industry for commercial exploitation. He made particular reference to processes for the manufacture of vitamin C and bacterial diastase, which are shortly to be started on commercial scale.

NCL, POONA—Prof. M S. Thacker, Director-General, Scientific & Industrial Research, speaking at the opening ceremony of pilot plant laboratory

M E E T I N G

A meeting of the Civil Engineering & Hydraulic Research Committee will be held at the CSIR Secretariat, New Delhi, on January 13, 1961 at 11.00 a.m. Shri Kanwar Sain, Administrator, Rajasthan Canal Project, will preside.

Symposium on Redox Processes

The Chemical Research Committee of the CSIR is organizing a symposium on Redox Processes at the chemical laboratories of the University of Allahabad during Feb. 1-2, 1961. A large number of scientists and delegates from India and abroad including a delegation from U.S.S.R. are expected to participate in the symposium.

More than fifty papers, received from research chemists and scientists will be presented and discussed in the following technical sessions: Electrode Processes; Reactions; and Analytical Application.

Symposia on 'Upper Atmosphere' and 'IGY Data'

The symposia on 'Upper Atmosphere' and 'IGY Data' jointly organized by the Radio Research Committee of the CSIR and the Indian National Committee for IGY (*CSIR News*, Vol. 10, No. 16, p. 1) will be held at the National Physical Laboratory, New Delhi, during Feb. 13-17, 1961.

A large number of papers pertaining to various disciplines included under the IGY and IGC programmes such as solar activity, cosmic rays, geomagnetism and outer space, ionosphere, meteorology and aeronomy, and the surface and the interior of the earth have been received for presentation at the symposia. Last date for receiving scientific communications has been extended till Jan. 15, 1961.

Institutions and organizations who wish to send their delegates to the symposia should furnish their particulars to Dr. A. P. Mitra, Secretary, Radio Research Committee, NPL Buildings, New Delhi.

P E R S O N A L

● SHRI K.R. ACHARYA has been appointed Technical Information Officer, Publications Directorate, CSIR, New Delhi, with effect from Dec. 29, 1960.

● Shri R.N. SHARMA has been appointed, on promotion, Asst. Editor, Publications Directorate, CSIR, New Delhi, with effect from Dec. 3, 1960.

● DR. C.P. AGARWAL, Senior Technical Assistant has been appointed to officiate as Asst. Editor, Publications Directorate, CSIR, New Delhi, with effect from Dec. 3, 1960 *vice* Shri S. Ranga Raja Rao, on deputation abroad.

● SHRI B. GORUDADWAJAN has been appointed Personal Assistant (Tech.) to the Director, CGCRI, Calcutta, with effect from Nov. 16, 1960.

● SHRI R. SOUNDARARAJAN has been appointed Section Officer, CGCRI, Calcutta, with effect from Nov. 25, 1960.

(*Contd. on p. 2, col. 1*)

BRIEFS

State Award for CSIR Publications

Vigyan Pragati and *Research and Industry* have been awarded First and Second Prizes for *excellence in printing and designing* during 1960, in the competition organized by the Ministry of Information & Broadcasting. The awards have been made under the catogeries: (i) Periodicals (Other than Annuals)—Indian languages and (ii) Periodicals (Other than Annuals)—English.

Shri G. B. Pant, Union Home Minister, presented the award at a ceremony held at Vigyan Bhavan, New Delhi on Dec. 24, 1960.

Bibliography of Analytical Chemistry of Thorium

In view of the recent interest in thorium as a nuclear fuel and/or its separation from uranium, a bibliography of papers published during 1940-1958 on the above subject has been compiled by Sarvashri M. R. Verma, Jitendra Rai & Prabhu Dayal, NPL, New Delhi. The bibliography containing about 1000 entries has been divided into 18 sections. It includes papers on analytical methods and geology, chemistry and metallurgy of thorium. The papers on analytical methods include physical methods as well as rigorous analytical methods based on the use of organic and inorganic reagents, instrumental, chromatographic and solvent extraction methods. A separate section includes papers on the physico-chemical study of reaction of thorium.

The bibliography will be published as Supplements to the *Journal of Scientific & Industrial Research.*

PERSONAL

(*Contd. from p. 1, col. 3*)

● DR. K. VENKATARAMAN, Director, NCL, Poona, has been nominated Chairman, Development Council for Industries engaged in the Manufacture of Organic Chemicals, Ministry of Commerce & Industry.

● PROF. S.R. MEHRA, Director, CRRI, New Delhi, has been nominated a member of the Managing Committee of the Indian National Group of the International Association for Bridge & Structural Engineering.

Shri S.B. Deshaprabhu, Production Officer, CSIR, receiving the prizes awarded to CSIR publications

● DR. T. BANERJEE, Deputy Director, NML, Jamshedpur, has been nominated Chairman of the Methods of Chemical Analysis Sectional Committee of the Indian Standards Institution.

* * *

● DR. B.R. NIJHAWAN, Director and SHRI P. K. GUPTE, Asst. Director, NML, Jamshedpur, have been awarded the Certificate of Merit by the Indian Institute of Metals as co-authors of the *Kamani Award*, best paper presented to the Institute during 1958-59.

● SHRI S.M. ARORA, Junior Scientific Officer, NML, Jamshedpur, has been awarded the *Kamani Gold Medal* for 1958 by the Indian Institute of Metals.

● SHRI S. RANGA RAJA RAO, Asst. Editor, Publications Directorate, New Delhi, who is on deputation to U.K., has been elected a member of the *Institution of Information Scientists.*

Dr. M. N. Ramaswamy

Dr. M. N. Ramaswamy has been appointed Assistant Director, CIMPO (Bangalore Zonal Office), with effect from Nov. 26, 1960.

Born in 1905 at Mysore, he got his education at Mysore and Dacca Universities and worked as Tata Research Scholar at the Indian Institute of Science, Bangalore. Later, he proceeded abroad for higher studies at the Forstliche Versuchsanstalt (Forest Experimental Station), University of Munich, where, after completing the Diploma Course in Forestry, he obtained Doctorate (Magna cum laude) on his thesis, *Beech Forest Crops on Basalt Soils.* Under a Colombo Plan Scholarship he worked in Australia on Minor Forest Products.

He has been responsible for the establishment of the Forest Research Laboratory, Bangalore and he served the Laboratory for 22 years (1938-60), first as Forest Chemist and since 1952 as Chief Research Officer. He planned and completed the preliminary work for the expansion and development of the Laboratory as a Zonal Research Institution in Forest Products for South India. He had been a Special Officer for rayon, Mysore State; In-charge of pyrethrum and lac cultivation in Mysore State, and CSIR Essential Oils Research Centre at Bangalore; and lecturer in minor forest products at the Indian Forest Colleges, Dehra Dun, Coimbatore and Kerala University.

Dr. Ramaswamy is the author of many publications relating to minor forest products and allied subjects. He is a Fellow of the Indian Academy of Sciences and is closely associated with numerous scientific and technical committees of the Central and States Governments and Indian Standards Institution.

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Production of Ferro-titanium—Studies have been undertaken on the production of ferro-titanium—an important alloying constituent and a deoxidiser in iron and steel industry—by aluminothermic reaction.

The reaction was carried out in a vessel lined with magnesite and preheated to the desired temperature. A charge consisting of ilmenite, aluminium, and suitable energisers was gradually added as the reaction proceeded. The effect of temperature of preheating of charge and vessel, quantity and type of accelerator and particle size of aluminium were studied. Trials carried out so far have indicated that it is possible to produce an alloy of desired specification with good over-all recovery.

Development of Bimetals—Processes for making bimetals of high electrical resistivity and suitable for use in electrical equipment up to 200°C. and 300°C. have been developed on laboratory scale.

Considerable quantities of both types of bimetals of 0.010—0.040 in. thickness have been produced for supplying to various interested firms.

CGCRI, CALCUTTA

Plastic Properties of Clays—Studies have been undertaken to improve the plastic and working properties of clays used in ceramic bodies by introducing organic matter. Addition of moss (10 parts) or bark extract (5 parts : about 3 per cent concentration) to 100 parts of clay is found to improve the plastic and working properties. Addition of moss develops offensive odour in clays. Preliminary results have indicated that organic matter treated clays can be used in place of imported ball clays.

CFTRI, MYSORE

Browning in Fruit Products—The effect of different chemicals on non-enzymatic browning in fruit products has been studied. β-Carotene protects orange and lime squashes, potato flour and sucrose-glycine systems against browning. Its presence in the natural state in mango pulp has a similar protective effect.

Addition of ascorbic acid to *amla* juice does not enhance browning; whereas tyrosine accelerates browning, glycine causes more browning than lysine and cysteine does not show any protective action. Addition of ascorbic acid causes more browning in lime juice than in orange or tomato juice.

In *jaman* and grape juices, guava pulp and sapota squash, sulphur dioxide enhances discolouration. Purified anthocyanin pigment from *jaman* juice, methanol extract of sapota pulp, tannic acid and pectin are not responsible for this unusual behaviour of sulphur dioxide. Addition of sapota pulp to sulphited lime squash causes more discolouration than in squash preserved with sodium benzoate or by pasteurisation.

CLRI, MADRAS

Disposal of Tannery Wastes—Experiments carried out in specially improvised equipments have shown that the use of chemical coagulants can be dispensed with if tannery wastes containing chrome are mutually precipitated with the wastes of other tannery yards. The supernatant liquor on mixing with domestic sludge and subjecting to biological treatments by the activated sludge system of trickling filter system, produces effluent which is clear, neutral, odourless and free from toxic substances, like chromium and sulphide.

Biological Ageing of Collagen—Study of skins of different age groups of rats has shown that the bound carbohydrate content of collagen increases with age and the binding of carbohydrate is a part of ageing process. The shrinkage temperature of collagen also increases with age and there is significant increase in the content of hydroxyproline.

RRL, HYDERABAD

Activated Earth—Fuller's earth suitable for bleaching of lubricating oils has been developed from Korvi, (Mysore State) earth (*CSIR News*, Vol. 10, No. 6, p.5).

A sample (40 kg.) of the earth was supplied to *Indian Refineries Ltd* for its evaluation in bleaching lubricating oils from Nahorkatiya crude. The sample examined in U.S.S.R., has a high silica and low alumina content as compared to U.S.S.R. clays. It has high toluene absorption and is superior to U.S.S.R. clays in improving the colour of lubricating base oil. The earth is suitable for bleaching of jute batching oil and other lubricating oils from Nahorkatiya crude.

Sponsored Research

Inducing Spawning in Fish—The effect of various mammalian hormones on the spawning of catfish (*Heteropneustes* and *Clarias*) has been studied. Preliminary investigations have shown that hormones which brought forth viable eggs in the intact skipper frog were ineffective in inducing spawning in the hypophysectonised skipper frog. Higher doses of homoplastic pituitary glands were ineffective in inducing oviposition.

Pituitary glands of catfish and skipper frog, on treatment with trichloroacetic acid (1.25 per cent) for 24 hr induced ovulation. The acid in which the glands were immersed was also capable of inducing spawning in catfish but not in the frog. Pyridine treated pituitary glands gave negative result and ammonium sulphate treated glands gave positive result—L S. Ramaswami & A B. Lakshman, Central College, Bangalore.

Acid Metabolism in Plants—Methods have been developed for isolation, characterization and estimation of tartaric acid from tamarind leaves employing ion exchange technique and paper chromatography. A detailed study of tartaric acid metabolism in various parts of the tamarind plant, such as leaves, buds, flowers and fruits, have shown that seasonal changes cause appreciable variations in the metabolism of leaves and fruits—Shri Ranjan & (Miss) K. K. Patnaik, Allahabad University, Allahabad.

The following research schemes, so far sponsored by the CSIR at the Malaria Institute of India, Delhi have been taken over by the Union Ministry of Health, New Delhi : (i) *Screening of antimalarial drugs* and (ii) *biological assaying of insecticides.*

Dr Ulrich Hutter

Prof. Ulrich Hütter, Dr Rer. Techn., Professor of Aeronautics, Stuttgart Institute of Technology, West Germany and an expert on wind power, visited the National Aeronautical Laboratory, Bangalore, on invitation, and delivered the following four lectures on different aspects of wind power: (1) The aerodynamic layout of wind blades for wind turbines with high tip-speed ratio; (2) production of large wings for fast running wind turbines from fiberglass reinforced plastics; (3) layout and adaption of wind wheels driving electrical generators or water pumps, considering the frequency distribution of wind velocity; and (4) experience with medium and large wind electric plants for individual use and electrical net works.

During his stay (Dec. 29, 1960 to Jan. 15, 1961), Dr Hütter advised the NAL on the working of 6 kW Allgaier wind electric generator (designed by Dr Hütter and received as present from West German Government) installed by the Laboratory at Khapat Agricultural Farm, Porbandar and also on problems of wind power utilization in India.

Research Papers

Synthesis of some arylamino- and arylguanidino pyrimidines—DOLLY ROY, S. GHOSH & B.C. GUHA, University College of Science & Technology, Calcutta. *J. org. Chem.*, **25** (1960), 1909–12.

Statistical studies on properties of ceramic wall tiles : Pt I—Grazing resistance—S. KUMAR & S.B. ROY, CGCRI, Calcutta. *Trans. Indian ceram. Soc.*, **19** (1960), 44-50.

Statistical studies on properties of ceramic wall tiles : Pt II—Absorption, modulus of rupture and impact resistance—S. KUMAR & S.B. ROY, CGCRI, Calcutta. *Trans. Indian ceram. Soc.*, **19** (1960), 51-58.

Use of pyrophyllite from Hamirpur in refractory and enamels —M.L. MISRA & V.G. UPADHYAYA, CGCRI, Calcutta. *Trans. Indian ceram. Soc.*, **19** (1960), 67-69.

PATENTS & PROCESSES

Application Filed

74450 : *Improvements in or relating to the manufacture of maleic anhydride*—B.S. Threhan & R.T. Thampy, Shri Ram Institute for Industrial Research, Delhi.

Applications Accepted

67636 : *An improved process relating to thermal polymerization of unsaturated fatty acids*—B.G. Sharma & R.K. Bhatnagar, Shri Ram Institute for Industrial Research, Delhi.

67822 : *A process for the extraction of phenols from coal tar oil fractions or coal hydrogenation oils*—J.G. Shah, A.N. Basu & A. Lahiri, CFRI, Jealgora.

68172 : *A new process for the preparation of crotonaldehyde*—H. Ibrahim, V.V. Deshpande & N.R. Kuloor, Shri Ram Institute for Industrial Research, Delhi.

Processes Ready for Exploitation

SURFACE COATINGS FROM CASTOR OIL

The Regional Research Laboratory, Hyderabad has developed a process (Indian Pat. No. 69410) for preparing light coloured varnishes with good drying characteristics from castor oil. The novel features of the process are that a set of reactions comprising of esterification, adduct formation, dehydroxylation and polymerisation take place *in situ*.

The process has been successfully tried on pilot plant scale and 10 different grades of varnishes in batches of 25 lb. each have been produced.

All the raw materials (castor oil, rosin, glycerol, sodium bisulphate and maleic anhydride) excepting maleic anhydride are indigenously available. The equipment required is simple and can be fabricated locally.

Total capital outlay for a pilot plant capable of producing 5,000 lb. of varnish per day is estimated at about Rs 1.85 lakhs.

Parties interested in taking up the commercial development of the process may write to the Secretary, National Research Development Corporation of India, Mandi House, New Delhi.

SMOKELESS DOMESTIC FUEL

The Regional Research Laboratory, Hyderabad has collected detailed technical and economic data on the production of smokeless fuel (kolsite) from the pilot plant for low temperature carbonization of non-coking and weekly caking coals working at the Laboratory since 1954. Kolsite is being sold in Hyderabad and Secunderabad.

Total capital outlay for plants with capacities of 800 and 1,600 tons per day has been estimated at Rs 175 lakhs and Rs 306 lakhs respectively. Cost of production of semi-cake from Singareni and Jambad coals in 800-ton plant has been estimated at Rs 50.14 and Rs 35.15 per ton respectively. The cost of production can be reduced to Rs 47.20 and Rs 31.19 respectively if production is undertaken in 1,600-ton plant.

Parties interested in large scale manufacturing of the product can be furnished details of project specification and equipment and technical assistance for fabrication, installation and operation of plant.

Preliminary project report and further information may be had from the Secretary, National Research Development Corporation of India, Mandi House, New Delhi.

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CSIR NEWS

VOL. II NEW DELHI—FEB. 27, 1961 : PHALGUN 8, 1882 No. 4

MEETINGS

A meeting of the *Executive Council, Central Mining Research Station*, Dhanbad, will be held at the Station on March 6, 1961 at 9.30 a.m.

A meeting of the *Executive Council. Central Road Research Institute*, New Delhi, will be held at the Institute on March 8, 1961 at 10.30 a.m. Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, will preside.

A meeting of the *Executive Council, Central Electrochemical Research Institute*, Karaikudi, will be held at Bangalore, on March 12, 1961, at 10.00 a.m.

Belting Leather—CLRI Demonstration

A process for the manufacture of vegetable tanned belting leather from Indian buffalo hide will be demonstrated at the Central Leather Research Institute (CLRI), M dras from April 5 to May 11, 1961. Representatives of leather industry and tanneries who wish to attend the demonstration may send their particulars to the Director, CLRI, Madras.

The process has been standardised under the advice of Dr. K. Wolf, Unesco Expert, working at the Instiute.

Prime Minister Visits CEERI

Shri Jawaharlal Nehru, Prime Minister of India and President, CSIR, accompanied by Dr. K. L. Shrimali, Union Minister for Education, Shri M. L. Sukhadia, Chief Minister of Rajasthan, Shri G. D. Birla, Chairman, Birla Education Trust and Shrimati Indira Gandhi visited the Central Electronics Engineering Research Instiute, Pilani on Feb. 11, 1961. They were shown round the various laboratories of the Institute.

Shri Nehru showed keen interest in the processes and techniques developed at the Institute, particularly the fabrication of specialised electronic valves, high quality microphones and electronic test instruments, and in the operation of a radar set fitted with a transmitter valve (magnetron) fabricated at the Institute. Prof. M. S. Thacker, Director-General, Scientific & Industrial Research, presented to the Prime Minister a sample of the magnetron.

PERSONAL

●SHRI G. P. MATHUR has been appointed, on promotion, Senior Scientific Officer : Grade I, NML, Jamshedpur, with effect from Jan. 12, 1961.

●SARVASHRI N.G. BANERJEE, P.K. GUPTA and J. GOSWAMI have been appointed, on promotion, Senior Scientific Officers : Grade II, NML, Jamshedpur, with effect from Jan. 2, 1961.

●SHRI P.L. SACHDEV has been appointed Senior Scientific Officer : Grade II, NML, Jamshedpur, with effect from Jan. 25, 1961.

●SHRI P.B. CHAKRABORTY, Senior Scientific Officer : Grade II, NML, Jamshedpur, relinquished charge of his post on Feb. 6, 1961.

●SHRI N.C. MAZUMDAR on transfer from CSIR Secretariat, New Delhi, joined as Administrative Officer, BITM, Calcutta, with effect from Jan. 2, 1961 *vice* Shri A.P. Roy Chowdhury.

* * *

●DR. U.K. BANIK, Senior Scientific Officer, IIBEM, Calcutta, left for U.S.A. on Jan. 10, 1961 for higher studies in Physiology of Reproduction under a fellowship of the Worcester Foundation for Experimental Biology, Massachusetts.

●SHRI A.P. CHOWDHURY, Senior Scientific Officer, NML, Jamshedpur, after completion of his 6 months' training in U.K. in Design and Development of Electronic Instrument for Metallurgical Research and Industry, under the Colombo Plan returned to India and resumed duty with effect from Jan. 26, 1961.

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●DR. K.S. KRISHNAN, Director, NPL, New Delhi, has been nominated a member of the Executive Committee, Indian Standards Institution, New Delhi, for a further period of one year ending Dec. 31, 1961.

(*Contd. on p. 2, col. 2*)

CEERI, PILANI—The Prime Minister in the Speech Communication Laboratory of the Institute

BRIEFS

IGY Symposium

The four-day symposium on 'IGY Data' and 'Upper Atmosphere' jointly organised by the Indian National Committee for the International Geophysical Year (IGY), the Radio Research and the Physical Research Committees of CSIR ended at the National Physical Laboratory, New Delhi on Feb. 16, 1961. The main object of this symposium was to review the work done in India during the International Geophysical Year, 1957-58 and the International Geophysical Cooperation, 1958.

The symposium was opened by Dr. K.S. Krishnan, President of the Indian National Committee for IGY. Scientists working in different disciplines of IGY largely from the India Meteorological Department, All India Radio, Physical Research Laboratory, Ahmedabad, National Physical Laboratory, New Delhi, Tata Institute of Fundamental Research, Bombay, and Survey of India, Dehra Dun, attended the symposium.

About eighty papers received from scientists were presented and discussed in the following four technical sessions : Solar Activity, Cosmic Rays, Geomagnetism and Outer Space ; Ionosphere ; Meteorology, Ozone and Airglow ; and Surface and Interior of the Earth. Each day's programme began with an opening talk to survey the highlights of the IGY discoveries and achievements in the respective fields.

In addition, three special evening talks on the following subjects were delivered : Earth's Magnetic Field (Dr. K.S. Krishnan); Middle Atmosphere (Dr. K.R. Ramanathan); and Meteorology of the Lower Stratosphere over India (Dr. P.R. Krishna Rao).

Research Fellowships

The following have been awarded CSIR Fellowships for research on projects noted against their names :

Senior Fellowship :

SMT. AMINA DUTTA—*Biosynthesis and metabolism of gibberellic acid* (Bose Institute, Calcutta).

Junior Fellowships :

1. SHRI HARI KISHAN GAKHAR—*Synthetic perfumes* (Panjab University, Chandigarh).

2. SHRI N. S. PANICKER—*Solvent effect in nucleophilic aliphatic substitutions* (University of Kerala, Trivandrum).

3. SHRI THOMAS BALIAH—*Design of high head gates* (Irrigation Research Station, Poondi).

Research Schemes Terminated

The following research schemes have been terminated with effect from Feb. 28, 1961.

1. *Comparison of the chemistry of normal chromosomes with those of malignant cells*—Dr. A.K. Sharma, University College of Science, Calcutta.

2. *Dielectric properties of liquids in the radio and ultra frequency regions*—Dr. Prem Swarup, Allahabad University, Allahabad.

3. *Catalysed conversion of tar acid in low temperature tars into phenols*—Dr. K.L. Roy, University of Calcutta, Calcutta.

4. *Studies on the pigments of Indian lichens*—Prof. S. Rangaswami, Andhra University, Waltair.

5,6,7 & 8. *Designs of gates including high head gates; Evolving an efficient design of bed sediment sampler; Cavitation studies in various kinds of hydraulic turbines*; and *Volute siphon and siphon spillways*—Director, Irrigation & Power Research Institute, Amritsar.

9. *Standardisation and correlation of field and laboratory methods for determining the safe bearing capacity of alluvial strata*—The Superintending Engineer, P.W.D., Lucknow.

PERSONAL

(Contd. from p. 1, col. 3)

●DR. ATMA RAM, Director, CGCRI, Calcutta, has been elected Vice-President of the Institution of Chemists (India), Calcutta.

●DR. V. SUBRAHMANYAN, Director, CFTRI, Mysore and DR. H.A.B. PARPIA, Liaison & Extension Officer, CSIR, New Delhi have been nominated members of the Committee constituted by the Ministry of Commerce & Industry to examine the progress made in the Installation of Factories for Manufacture of Milk Products in India.

* * *

●DR. C. G. BALACHANDRAN, Junior Scientific Officer, CBRI, Roorkee, has been elected a member of the Acoustical Society of America.

●SHRI B.K. NAYAR, Senior Scientific Officer, NBG, Lucknow, has been awarded the D. Phil. degree by the Gauhati University for his thesis, *Studies in Polypodiaceae.*

●SHRI O.P. GARG, Senior Technical Assistant, Publications Directorate, CSIR, New Delhi, has been declared qualified for the award of Ph. D. degree by the University of Delhi for his thesis : *A Morpho-Physiological Study of the Growing Apex with special reference to its Influence upon Growth and Development of some Crop Plants.*

●SHRI R.P. WARICK, Junior Technical Assistant, Publications Directorate, New Delhi, has been declared eligible for the award of Ph. D. degree in Botany by the Bombay University for his thesis : *Physiological and Ecological Studies of Halophytes.*

●SHRI G. C. TRIGUNAYAT, Ex-Research Fellow, CSIR scheme, Imperfections in crystals and the study of growth and etch phenomena in crystals (Investigator-in-charge : Dr. A. R. Verma, University of Delhi) has been awarded the Ph. D. degree by the University of Delhi for his thesis : *A Coordinated Optical, Interferometric and X-ray Diffraction Study of the Phenomena of Polytypism in Cadmium Iodide Crystals in relation to Crystal Growth.*

●SHRI S.K. GARG, Ex-Research Fellow, CSIR scheme, Dielectric behaviour of liquids in the UHF and microwave region (Investigator-in-charge : Dr. Prem Swarup, Allahabad University, Allahabad) has been awarded the D. Phil. degree by the Allahabad University for his thesis : *Study of Primary, Secondary and Tertiary Aliphatic Amines in the Frequency Region 1 Mc/s. to 30,000 Mc/s.*

●SHRI KRISHNA CHANDRA SRIVASTAVA, Ex-Research Assistant, CSIR scheme, A systematic chemical examination and analysis of the fat, protein and vitamin content of the fish *Labeo rohita* (Allahabad University, Allahabad) has been awarded the D. Phil. degree by the Allahabad University for his work on the scheme.

●SHRI P.L. SAWANT, Junior Research Fellow, CSIR Scheme, Preservation of fish (Institute of Science, Bombay) has been awarded the Ph.D. degree by the University of Bombay for his work in the scheme.

RESEARCH IN PROGRESS

National Laboratories

CFRI, JEALGORA

Unsaturation in Coal—Estimation of unsaturation in coal by the conventional iodine or bromine absorption methods gives confusing results. Investigations were, therefore, carried out on an improved method based on the use of dilute solution of potassium permanganate (2-5 per cent).

Using the method, the degree of unsaturation in low-and high-rank coals was studied. The results showed that a small fraction of total carbon in low-rank coals exists in combination with ethylene double bonds, whereas in high-rank coals there is no unsaturation indicating that unsaturation is confined to coals of only lowrank—P. N. MUKERJEE, J. N. BHOWMIK & A. LAHIRI.

CGCRI, CALCUTTA

Glass Moulds—Study of the microstructures of various cast iron compositions and their performance trials have been carried out to ascertain their suitability for use in making glass moulds. The results show that chill cast irons can be used for making glass moulds and that the moulds suitable for heavy duty jobs may be prepared by adding small quantities of chromium (less than 0.5 per cent) in cast composition.

Pig iron (with or without addition of small quantities of silicon) cast in a suitable metal mould has also been found satisfactory for the purpose.

CLRI, MADRAS

Leathers from Bihar Hides and Skins—Samples of hides and skins from Bihar have been examined for assessing their leather making characteristics.

Cow hides from Patna which are normally spready and heavy are found suitable for upholstery, case leathers and other printed types of leathers. Ranchi cow hides yield only loose grained leather with smooth grain but the vein marks are very prominent. Hides from Darbhanga, Ranchi, Bhagalpur, and Gaya have been found suitable for manufacture of sole leather and picking band leather.

CECRI, KARAIKUDI

Refining of Tin—Scrap reclaimed tin (purity, 96-97 per cent) is unsuitable for tinning of food containers and production of bell metal, due to its high lead content. A method for electrolytic refining of scrap reclaimed tin producing refined tin with less than 0.1 per cent lead has been worked out and satisfactorily tried in a 6-gal. capacity tank using multiple electrode system.

The method is largely free from the defects (formation of sludges, treeing of the deposits, loss of current efficiency due to detachment of loose deposit from cathode, etc.) found in conventional tin refining processes.

CBRI, ROORKEE

Solar Clock—A simple form of sun dial, called the solar clock, has been designed and set up. It is simple to fabricate and is of educational value in schools and colleges.

The solar clock consists of a vertical pin (20 cm.) centrally mounted on an aluminium panel on which the lines for different hours from 7 a. m. to 5 p. m. are marked. These hour lines are straight and parallel to the noon-line which points towards geographical north and south. The panel with the pin is tilted by an angle equal to the latitude of the place, by raising the northern side in the northern hemisphere and the southern side in the southern hemisphere. The curved paths traced by the shadow of the tip of the pin in different days of the year are computed and marked on the panel. Indian Standard Time, correct to a minute, can be determined by recording the position of shadow of the pin and after making some simple corrections.

IIBEM, CALCUTTA

Leishmania donovani of Kala-Azar—A cutaneous form of leishmaniasis develops in a few cases (about 5 per cent) of kala-azar after clinical cure and the parasites then get lodged in the skin from where they can be isolated in pure culture. The precise mechanism of this change in localization of *L. donovani* from internal organs to the skin has been under study. An analysis of the parasites of kala-azar and dermal leishmaniasis cases revealed interesting variation in the antigenic make-up of *L. donovani* of the two pathological processes. It has been observed that while the two parasites possess a common major antigenic mosaic, they differ in their contents of specific antigens—ANJALI SEN & S. MUKERJEE.

Sponsored Research

Plant Cells of Allium cepa—Comparative effect of treating bulbs of *Allium cepa* with healthy young root tips with colchicine and gammexane and the compatibility of the two compounds have been studied. The bulbs were kept in 1 per cent colchicine for $1\frac{1}{2}$ hr and then in gammexane solution (25 per cent) for another $1\frac{1}{2}$ hr in room temperature and then transferred to Knop's medium. In another set of experiments gammexane treatment was followed by colchicine. The results show that gammexane causes lethal injury to the colchicine treated tissue whereas damage caused by colchicine to gammexane treated material is less.

The possible role of the different constituents of Knop's solution in the recovery of tissue injured by gammexane was studied. The absence of polyploidy was unhampered in the absence of ferric chloride or potassium sulphate; tumour formation was inhibited in the former case, whereas in the latter case tumour developed. In the medium lacking magnesium sulphate, polyploid cells were very few and the tissue soon degenerated.

The effect of some natural derivatives of coumarin (herniarin, seselin, marmesin, mesoul, dimethyl mesoul, psoralene and isopsoralene) on root tip cells of *Allium cepa* has been also studied. Herniarin, seselin and psoralene had no remarkable effect. Marmesin produced fragments, diplochromosome and chromatid bridges and was toxic in higher concentrations. Isopsoralene proved valuable as a pretreatment chemical as after 1 hr of its treatment, well clarified metaphase plates were observed. On prolonged treatment, fragments, diplochromatids and separated centromers were also noticed. Mesuol after a long treatment caused despiralisation, fragmentation and diplochromatide but dimethyl

mesuol did not cause fragmentation —(Miss) MANDIRA CHAUDHURI, Calcutta Univerisity, Calcutta.

Soil Corrosion—Studies on corrosion of materials of construction (galvanized iron, cast iron and asbestos cement pipe materials, etc.) by soil have been in progress.

Total soluble salts contents, hydrogen ion activity, moisture equivalent, air-pore space and specific resistivity of soil samples from Madras State have been determined and chemical analysis of water extract of soil has been carried out. The values have been correlated with corrosivity of soil.

For the study of corrosion phenomena, a soil corrosion cell has been developed. In this cell the behaviour of different soils and metals can be investigated under uniform conditions of moisture and aeration.

Accelerated beaker immersion tests are being carried out to study the corrosion loss and corrosion rate of the materials subjected to the action of varying concentrations of sulphates, chlorides and carbonates of calcium, magnesium, sodium and potassium under controlled moisture conditions—J. WALTER, A.E. RAMALINGAM & P. SITALAKSHMI, Concrete and Soil Research Laboratory, P. W. D., Madras.

Research Papers

Weak dipolar intraction in solutions in systems: Cyclohexane+chlorobenzene and carbon tetrachloride+chlorobenzene—A.V. Anantaraman, S.N. Bhattacharyya & S.R. Palit, Indian Association for the Cultivation of Science, Calcutta. *Trans. Faraday Soc.*, **57** (1961), 40-50.

Fluorspar and its beneficiation—P.V. Raman & P.I.A. Narayanan, NML, Jamshedpur. *Blast Furnace & Steel Plant*, **48** (1960), 1045-1050.

Development of graphite crucibles from Indian raw materials—T.V. Prasad & H.P.S. Murthy, NML, Jamshedpur. *Trans. Indian ceram. Soc.*, **19** (1960), 59-66.

Hydrogen and austenite stabilization—E.G. Ramachandran & C. Dasarathy, NML, Jamshedpur. *Acta metallurgica*, **8** (1960), 729-30.

Surface area of coal—K.A. Kini & A. Lahiri, CFRI, Jealgora. *Fuel, Lond.*, **39** (1960), 515.

Prof. G.A. Rohlich

Prof. Gerard A. Rohlich, M.S., Ph.D., of the University of Wisconsin (U.S.A.) and a Special Consultant to the World Health Organisation (W.H.O.), visited the Central Public Health Engineering Research Institute, Nagpur from Feb. 1 to Feb. 12, 1961. He assessed the requirements of scientific apparatus and equipments for research programme of the Institute and its field centres at Delhi, Bombay, Hyderabad and Poona. W.H.O. is to supply, out of its special grant, apparatus and equipment worth Rs. 25 lakhs to the Institute.

Prof. Rohlich delivered a lecture on some of his experiences on sewage disposal in Madison State at a meeting of the scientific staff of the Instiute.

Dr. L.K. Doraiswamy

Dr. L.K. Doraiswamy has been appointed, on promotion, Assistant Director, NCL, Poona, with effect from Dec. 26, 1960.

Dr. Doraiswamy (*b.* 1927, Bangalore) after graduation from Madras University, left for U.S.A. (1948) and got his M.S. and Ph. D. degrees in chemical engineering from the University of Wisconsin. He also worked for one year at the Research and Development Section of the R.L. Carlisle Chemical and Manufacturing Co., Brooklyn and returned to India in 1953. He joined NCL, Poona in 1954.

He has carried out researches in the field of reaction kinetics, chemical engineering, thermodynamics and liquid-liquid extraction and has published a number of papers.

PATENTS & PROCESSES

Applications Accepted

67490 : *Improvements in or relating to the preparation of adhesive tapes*—S.L. Kapur & B.R.K. Rao, NCL, Poona.

68174 : *Refractory compositions containing non-refractory chrome ore and refractory products made therefrom*—M. R. Rao, N. V. Naidu & H.V. Bhaskar Rao, NML, Jamshedpur.

69781 : *Refining of cottonseed oil to light-coloured products*—V.P. Harigopal, S.R. Rao, K.T. Achaya & S.H. Zaheer, RRL, Hyderabad.

Application Sealed

65440 : *A process for the extraction of wax from sisal waste*—S.M. Shah, V.K. Hinge, V.V. Bhaskar & R.C. Shah, NCL, Poona.

Process ready for Exploitation

AMINOPHENOLS

The Central Electrochemical Research Institute, Karaikudi has developed an electrolytic process (Indian Pat. Nos. 53195, 60865 and 71978) for the production of *p*-aminophenol and 2:4-diaminophenol starting from nitrobenzene and *m*-dinitrobenzene respectively. The process is simple and, unlike conventional chemical methods, does not require costly starting materials.

The process mainly consists in reducing a suspension of the corresponding nitrobenzene in dilute sulphuric acid in an electrolytic cell. The same cell can be used for the manufacture of both the aminophenols. The process has been satisfactorily worked out in a cell capable of reducing 1 lb. of nitrobenzene per charge.

Plant and machinery required are simple and can be locally obtained.

Parties interested in taking up the commercial development of the process may write to the Secretary, National Research Development Corporation of India, Mandi House, New Delhi-1.

Processes available free of Charge

Technical details of the following processes developed at the national laboratories are available to interested parties free of charge.

1. *A simple specific gravity indicator for use in heavy medium coal washing* (Indian Pat. No. 73576)—Central Fuel Research Institute, Jealgora.

2. *Manufacture of cadmium sulphide 'Orange'* (Indian Pat. No. 71301)—Regional Research Laboratory, Hyderabad.

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R.N. 4212/5

CSIR NEWS

VOL. II NEW DELHI—MARCH 13, 1961 : PHALGUN 22, 1882 No. 5

MEETINGS

A meeting of the *Committee* of the *Board of Scientific and Industrial Research* will be held at the CSIR Secretariat, New Delhi on March 23, 1961 at 10.00 a.m. Lala Shri Ram will preside.

A meeting of the *Board of Scientific and Industrial Research* will be held at the Ministry of External Affairs, Central Secretariat, New Delhi on March 24, 1961 at 9.00 a.m. Shri Jawaharlal Nehru, Prime Minister, will preside.

A meeting of the *Governing Body* will be held at the Ministry of External Affairs, Central Secretariat, New Delhi on March 25, 1961 at 9.00 a.m. Shri Jawaharlal Nehru, Prime Minister, will preside. This will be followed by the Annual General meeting of the Society.

RRL, Assam—Foundation Stone

Prof. Humayun Kabir, Minister for Scientific Research and Cultural Affairs and Vice-President of the CSIR will lay down the Foundation Stone of the laboratory buildings of the Regional Research Laboratory, Jorhat (Assam) on March 18, 1961.

Presentation of Bhatnagar Award to Dr. Krishnan

The presentation ceremony of Shanti Swarup Bhatnagar Memorial Award to Dr. K. S. Krishnan, Director, National Physical Laboratory, New Delhi, will be held at the Laboratory on March 24, 1961 at 5.30 p.m. Shri Jawaharlal Nehru, Prime Minister of India will present the award.

PERSONAL

●DR. J.C. SRIVASTAVA has been appointed Officer-on-Special Duty (Extension), CSIR Secretariat, New Delhi, with effect from Feb. 16, 1961.

●DR. (MRS.) F. THIVY has been appointed Senior Scientific Officer : Grade II, CSRI, Bhavnagar, with effect from Jan. 3, 1961.

●SHRI S.L. AGGARWAL has been appointed Junior Scientific Officer, CBRI, Roorkee, with effect from Dec. 3, 1960.

●SHRI N.C. MAJUMDAR has been appointed, on promotion, Junior Scientific Officer, CBRI, Roorkee, with effect from Feb. 18, 1961.

●SHRI T. VISHVANATHAN assumed charge as Accounts Officer, CEERI, Pilani, with effect from Feb. 17, 1961 *vice* Shri M.M. Sircar retired.

●SHRI A.K. BHOWMIK, Senior Scientific Officer, Roorkee, relinquished charge of his post with effect from Jan. 23, 1961.

●DR. G.I. PATEL joined the NBG, Lucknow, as Pool Officer with effect from Dec. 30, 1960. He will work on problems relating to Field Horticulture.

●DR. AMALENDU SEN joined the RRL, Assam, as Pool Officer with effect from Jan. 12, 1961.

* * *

●DR. M.N. RAMASWAMY, Asst. Director, CIMPO Zonal Office, Bangalore, has been nominated a member of the Forest Utilization Advisory Board, Government of Madras.

●DR. A.B. BISWAS, Asst. Director, NCL, Poona, has been nominated a member of the Chemistry Advisory Committee, Department of Atomic Energy, Bombay.

●SHRI T.V. RAMAMURTHI, Senior Scientific Officer, NPL, New Delhi, has been permitted to act as Honorary Consultant to *Bharat Electronics Ltd.*, Bangalore for undertaking the large scale manufacture of ceramics capacitors, based on a process developed at NPL.

●The following officers have been nominated members of the Committee/Panel of Indian Standards Institution :

SHRI K. D. SHARMA, Deputy Director (Principal Member) and SHRI S.V. BHATYE, Junior Scientific Officer (Alternate Member), CGCRI, Calcutta—*Optical Instruments Sub-Committee.*

SHRI H.V. BHASKAR RAO, Asst. Director, NML, Jamshedpur—*Refractories Sectional Committee.*

DR. M. PANCHOLY, Asst. Director, NPL, New Delhi—*Panel for work of Acoustics.*

DR. L.A. RAMDAS, Asst. Director, NPL, New Delhi—*Forced Ventillation Sub-Committee.*

SHRI G.D. JOGLEKAR, Asst. Director, NPL, New Delhi—*Carbon Brushes Sub-Committee* (Member and Convener).

SHRI PREM PRAKASH, Asst. Director (Principal Member) and SHRI M.K. SEN GUPTA, Junior Scientific Officer (Alternate Member), NPL, New Delhi—*Drawing Instruments Sub-Committee*, *Optical Instruments Sub-Committee* and *Surveying Instruments Sub-Committee.*

SHRI C.V. GANAPATHY, Senior Scientific Officer, NPL, New Delhi—*Tropic Proofing Sub-Committee.*

SHRI M.R. VERMA, Senior Scientific Officer, NPL, New Delhi—*Panel on Rigid Foamed Polystyrene for Insulation.*

SHRI J.V. NAGARAJA, Senior Scientific Officer (Principal Member) and SHRI K.C. SRIVASTAVA, Junior Scientific Officer (Alternate Member), NPL, New Delhi—*Methods of Physical Tests Sectional Committee.*

DR. J.L. BOSE, Senior Scientific Officer, NCL, Poona—*Disinfectants Sub-Committee.*

Prof. M. S. Thacker

PROF. M. S. THACKER, Director-General, Scientific & Industrial Research and Secretary, Ministry of Scientific Research and Cultural Affairs has been appointed a Director of the *National Industrial Development Corporation Limited*, New Delhi with effect from Feb. 21, 1961.

PROF. M. S. THACKER has been nominated a member of the *Court* of the *Indian Institute of Science*, Bangalore by the Council of the Institute for the period 1961-64.

BRIEFS

Battery Technology Course

The seven-week course on Storage Battery Technology organized by the Central Electrochemical Research Institute, Karaikudi was inaugurated at the Institute by Dr. S. Subramaniam on Feb. 1, 1961.

The course, second in the series, is intended for training of technical personnel employed in industry and organizations engaged in the manufacture and testing of batteries.

Dr. Gyorgy Visits CFTRI

Dr. Paul Gyorgy, Director of Pediatrics, Philadelphia General Hospital and Chairman, Protein Advisory Group of the WHO/FAO/UNICEF visited the CFTRI, Mysore on Feb. 18-19, 1961. He discussed research programme of the Institute relating to protein foods and evinced keen interest in projects for the production of edible peanut meal and vegetable protein isolates and their utilization for combating protein malnutrition.

Research Fellowships

The following have been awarded CSIR Fellowships for research on projects noted against their names.

Senior Fellowship :

SHRI G. C. MAHAPATRA—*Exploration for remains of early man in India* (Panjab University, Chandigarh).

Junior Fellowships :

1. SHRI LALIT MOHAN MUKHERJEE—*Total synthesis of triterpenoids* (Presidency College, Calcutta).
2. SHRI ASOK MUKHOPADHYAY—*Thermodynamics of liquid mixtures* (Indian Association for the Cultivation of Science, Calcutta).
3. SHRI A. BANDOPADHYA—*Adrenal steroids and vitamin C in relation to diabetes* (Bikaner Medical College, Bikaner).
4. SHRI A. K. CHANDRA—*Respiratory activity of germinating rice embryo* (University College of Science, Calcutta).

* * *

The Director-General, Scientific & Industrial Research, has accepted the resignation of the following research fellows :

Senior Fellow :

SHRI CH. KALIDAS—*Thermodynamics of liquid mixtures*, Indian Association for the Cultivation of Science, Calcutta (January 21, 1961).

Junior Fellows :

1. SHRI S. R. SRIVASTAVA—*A systematic study (both fundamental and applied) of the clays and clay minerals of Madhya Pradesh with special reference to their economic suitability and a fundamental study of clay minerals associated with ore bodies*, University of Saugar, Saugar (January 7, 1961).
2. SHRI A. K. GANGULY—*Mechanism of vulcanisation of rubber*, Indian Association for the Cultivation of Science, Calcutta (February 1, 1961).
3. SHRI NIRMALENDU MITRA—*Non-aqeous acid base titration*, Jadavpur University, Calcutta.
4. SHRI S. GUHA—*Design of dust filter*, College of Engineering and Technology, Calcutta (January 31, 1961).
5. SHRI MUKUL BISWAS—*Thermodynamics of liquid mixtures*, Indian Association for the Cultivation of Science, Calcutta (January 28, 1961).

Research Schemes Terminated

The following research schemes have been terminated with effect from February 28, 1961.

1. *Development of the gas turbine and jet propulsion unit*—Dr. D. Banerjee, Bengal Engineering College, Howrah.
2. *Acid metabolism in plants*—Dr. Shri Ranjan, University of Allahabad, Allahabad.
3. *Pharmacological studies on a new anti-tubercular antibiotic*—Dr. (Mrs)S.Chandrashekhar, Vallabhbhai Patel Chest Institute, Delhi.
4. *Study of phyto-sociology and ecology of vegetation of humid tropics*—Dr. G.S. Puri, Central Botanical Laboratory, Allahabad.
5. *Production of antibiotic substances from* Streptomyces spp.—Dr. P. Nandi, Bose Institute, Calcutta.
6. *Efficient sluice valves*—The Director, Irrigation & Power Research Institute, Amritsar.

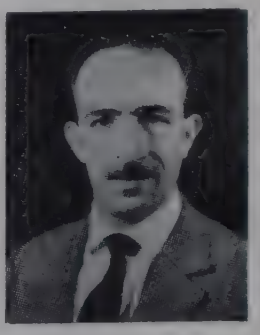
* * *

DR. S.V. SUNTHANKAR, Reader in Colour Chemistry, Bombay University will supervise the CSIR research scheme, Synthesis of heterocyclic steroids and polycyclic compounds (Bombay University, Bombay), in the absence abroad of Dr. B.D. Tilak, Investigator-in-charge of the scheme.

French Experts for Petroleum Institute

Mr. M. C. Flamand and Mr. R. Becart, experts from the French Institute of Petroleum (F.I.P.) have joined the Indian Institute of Petroleum (I.I.P.), Camp New Delhi with effect from Feb. 18 and Feb. 25, 1961 respectively. This brings the total number of experts assisting in the training of staff of the I.I.P to four.

Mr. M. C. Flamand



Mr. Michel Claude Flamand graduated in 1950 from the Ecole Catholique des Arts et Metiers de Lyon and worked for a year in the automobile industry (Citroen). In 1952, he joined the F.I.P. as Research Engineer. Since that time he has worked on the elaboration and applications of testing methods on lubricating oils for mono-and multi-cylinder gasoline engines. Since 1959 he has been pursuing research on wear and cooling of motors and critical examination of different types of foreign engines.

Mr. R. Becart

Mr. Roland Becart graduated from the Ecole Nationale Superieure de Chimie de Lille in 1945 and from the Ecole Nationale Superieure du Petrole et des Moteurs in 1951. He is licencie es-sciences and spent three months in the Chemical Engineering Department of the Massachussetts Institute of Technology. After working for three years in industry, he joined the F.I.P. in 1949 as Assistant Professor in Chemical Engineering and Process Engineer. He has been working as Process Engineer at the Compagnie d'Etudes et de Construction "TECHNIP" since its establishment in 1958.

ERRATUM

Delete para 2 of the news-item 'CMC Process Goes to Production' published in the *CSIR News*, Vol. 11, No. 3, p. 3.

RESEARCH IN PROGRESS

National Laboratories

CLRI, MADRAS

Neem Bark for Tanning—Air dried tender bark of neem (*Melia azadirachta*) obtained from branches of trees 3-4 years' old has been assayed for tanning potentiality. Tanning tests carried out according to usual E. I. tannage method show that leathers similar in characteristics to *avaram* tanned leathers can be produced. The yield of leather is about 25 per cent with shrinkage temperature of 80° C.

Mineral Tannages—A non-aqueous titration technique using glycol and isopropyl alcohol has been developed for determination of protein bound acids for untanned collagen and chrome bound acids in chrome tanned leathers. The technique is less time consuming and gives results comparable to existing methods. But unlike conventional methods, the chrome salts do not hydrolyse in the system.

CMRS, DHANBAD

Low Speed Wind Tunnel—Air Duct—A small wind tunnel for calibration of air velocity measuring instruments such as anemometers and velometers has been fabricated and installed as per specification of the National Physical Laboratory, Teddington (U.K.). It is of octagonal section, 18 inches between opposite sides, fitted with a variable speed axial flow exhaust fan.

A special flared inlet is provided in the funnel to ensure that the air stream is steady and free from separation at the walls as it enters the tunnel. A straightener placed a few inches from the curved part of the flare, and several screens with uniform mesh placed at different positions in the tunnel, ensure a uniform air stream of low turbulence through the tunnel.

Arrangement for operation of the anemometer or velometer from outside has been provided in the tunnel. Large glass windows and flush fitting on the inside walls are provided for observation of readings of instruments.

Sponsored Research

Physico-chemical Studies on Indian Silk—Dependence of *p*H of silk fibre on the amount of hydrochloric acid and potassium hydroxide taken up at room temperature has been investigated.

The maximum acid binding capacity of silk fibre is found to be 0.13 milli-equivalent/gr ; and the maximum base binding capacity is greater than 0.90 milli-equivalent/gr. The presence of 0.13—0.17 milli-equivalent/gr. of free carboxyl groups in silk fibroin has been estimated from the potentiometric titration curve. The amount of base bound in the strongly alkaline region, i. e., at *p*H more than 11, greatly exceeded the content of free carboxyl groups and may be due to phenolic hydroxyl groups of tyrosine residue.

Base binding capacity of silk fibrion in which hydroxyl groups are blocked by methylation with diazomethane have been studied. The study shows that in the *p*H range of 8-13, the amount of base bound by unmethylated fibre is 5-10 times more than that by the methylated fibre. The acid binding capacity of the fibroin however is not affected by methylation. It may, therefore, be concluded that the base binding capacity of silk fibroin may be determined, to a considerable extent, by the tyrosine residues in the polypeptide chain—S. BASU, (Miss) RAMA BHATTACHARYA & R. S. BANERJEE, University College of Science, Calcutta.

Dielectric Behaviour of Alkyl Amines—Systematic study of the complex dielectric constant of pure primary, secondary and tertiary alkyl amines and their mixture in benzene has been carried out at 0°C. to 65°C, and frequency range of 1 Mc to 37000 Mc. The salient results of the study show that (i) the relaxation time increases with chain length from primary to secondary and from secondary to tertiary amines and its distribution decreases with chain length and temperature; it is independent of the macroscopic viscosity; (ii) the relaxation time of amines in solution in benzene is smaller than that of pure liquid in spite of the high viscosity of benzene; (iii) the temperature dependence of relaxation time can be utilized in determining various thermodynamic quantities and the values can be compared with those obtained for viscous flow; (iv) the entropies of activation become more and more negative as the chain length increases; and (v) the free energies of activation, in general, increase with temperature.

The findings indicate that in primary amines there is a great possibility of independent free rotation of ($-NH_2$) group around C-N axis. In secondary and tertiary amines, the molecular rotation may occur around various C-K bonds and also about the long axis of the molecule. Macroscopic viscosity had little relation in the interpretation of relaxation time—PREM SWARUP, KRISHNAJI & S. K. GARG, Allahabad University, Allahabad (May 1957—Oct. 1960).

CMRS, DHANBAD—Mr. David Blickenstaff, Resident Representative of UNTAB being shown the air-duct fabricated and installed at the Station, during his visit on Feb. 11, 1961

Research Papers

Lightweight aggregates from Indian clays—V.S. Ramachandran, N.C. Majumdar & N.K. Patwardhan, CBRI, Roorkee. *Indian Concr. J.*, **34** (1960), 380-381.

Building stone in India—P. Kumar, CBRI, Roorkee. *Indian Eastn. Engr.*, **102** (1960), 557-559.

Sky component surfaces—T.N. Seshadri & R.C. Jain, CBRI, Roorkee. *Curr. Sci.*, **29** (1960), 433-434.

Rendering foamed concrete walls—S.K. Chopra & B.C. Jindal, CBRI, Roorkee. *Indian Concr. J.*, **34** (1960), 471-474.

New methods used for quarrying and saving building stone—P. Kumar, CBRI, Roorkee. *Indian Build.*, **8** (1960), 173-177.

Bearing capacity of piles by lead tests—Dinesh Mohan, G.S. Jain & Virendra Kumar, CBRI, Roorkee. *J. Instn. Engr.*, **41** (1961), 163-170.

A doubly-curved funicular shell roof for a cement store : Experimental construction at Roorkee—G.S. Ramaswamy, N.V. Raman & Zacharia George, CBRI, Roorkee, *Indian Concr. J.*, 35 (1961), 20-23.

Burmah-Shell and Assam Oil Scholarships

(Advertisement No. 5/61)

Applications are invited for Burmah-Shell Co. and Assam Oil Co. scholarships tenable in U.K. normally for a period of two years. Awards will be made to the best qualified candidates for advanced training in following subjects : (i) Oil Technology ; (ii) Petroleum Production Engineering ; (iii) Mining Engineering ; (iv) Chemical Engineering ; (v) Fuel Technology ; (vi) Geology and Geophysics ; (vii) Metallurgy and Foundry Practice ; and (viii) Coal Preparation.

Applicants should be first class M. Sc. or first class B.E., B.Sc. (Engng.) or B.Sc. (Tech.) in fields related to the subjects of training. Applicants should ordinarily be between 20 and 30 years of age.

Applications (4 copies) on prescribed forms together with crossed Indian Postal Order of Rs. 7.50 (Rs. 1.87 for scheduled castes/tribes) drawn in favour of the Secretary, Council of Scientific & Industrial Research, (CSIR), New Delhi, as application fee should reach by **March 25, 1961**. Further particulars and application forms may be obtained from the Secretary, CSIR, Rafi Marg, New Delhi-1.

FORM IV

(See Rule 6)

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6.	Names and addresses of individuals who own the newspaper and partners or shareholders holding more than one per cent of the total capital	

I, B.N. Sastri, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Feb. 28, 1961

(Sd.) B.N. SASTRI
Signature of Publisher

PATENTS & PROCESSES

Applications Accepted

69164 : *An improved process for the manufacture of maleic anhydride*—B.S. Trehan, R.T. Thampy & N.R. Kuloor, Shri Ram Institute for Industrial Research, Delhi.

69410 : *Improvements in or relating to the use of castor oil in surface coatings (ricin varnishes)*—M.C. Menon, J.S. Aggarwal & S.H. Zaheer, RRL, Hyderabad.

Applications Sealed

66295 : *Improvements in or relating to electronic receiving equipment using valves and transistors as linear circuit elements*—M.V. Joshi & T.V. Ramamurti, NPL, New Delhi.

66296 : *Improvements in or relating to radio receiving equipment using valves and transistors*—M.V. Joshi & T.V. Ramamurti, NPL, New Delhi.

66297 : *Improvements in or relating to transistorised receiving equipment*—M.V. Joshi & T.V. Ramamurti, NPL, New Delhi.

68377 : *Improvements in or relating to the protection of metallic surfaces against atmospheric corrosion*—K.S. Rajagopalan & G. Ramaseshan, CECRI, Karaikudi.

69780 : *Improvements in or relating to production of citric acid from sugar cane molasses*—B.S. Lulla & S.H. Zaheer, RRL, Hyderabad.

Dialdehyde Starch

A two-stage process for the preparation of dialdehyde starch from tapioca starch has been developed by the Central Electrochemical Research Institute (CECRI), Karaikudi. The starch is expected to find use in the manufacture of various plastics and polymers, in paper industry to impart wet strength, as a tanning agent in leather industry, as gelatin hardener for photographic papers and films, as a binding agent in tobacco manufacture and in the preparation of protective coatings, adhesives and emulsion paints.

Parties desirous of testing the suitability of the product for various purposes may write for samples to the Director, CECRI, Karaikudi.

Processes Leased Out

The following processes developed at the National Metallurgical Laboratory, Jamshedpur have been leased out for commercial exploitation to *Devidayal (Sales) Private Ltd.*, Bombay.

1. Electrolytic manganese metal (Pat. No. 49355).
2. Electrolytic manganese dioxide (Pat. No. 47982).

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R. N. 4212/5

CSIR NEWS

VOL. 11 IM 11/4/61 NEW DELHI—MARCH 27, 1961 : CHAITRA 6, 1883 No. 6

Bhatnagar Memorial Award Presented to Dr. Krishnan

Shri Jawaharlal Nehru, Prime Minister, and President, CSIR, presented the Shanti Swarup Bhatnagar Memorial Award to Dr. K. S. Krishnan, F. R. S., Director, NPL, New Delhi at a special function held at NPL, New Delhi on March 24, 1961. The function was attended by the Vice-President, CSIR, and distinguished scientists and industrialists.

Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs and Vice-President, CSIR, in his opening address referred to the invaluable service rendered by Dr. Krishnan and his band of young scientists to the cause of science in India and added that he was happy that the first Bhatnagar Memorial Award was given to Dr. Krishnan, the eminent scientist.

The citation read out by Shri P.M. Sundaram, Secretary, CSIR, stated as follows :

"Dr. Krishnan has carried out valuable researches in crystal physics, thermionics of metals and semiconductors, and generally in the physics of the solid state. His work on the lattice dynamics of ionic crystals is of fundamental significance.

"Dr. Krishnan's investigations on the distribution of temperature along filaments and tubes electrically heated *in vacuo*, have brought orderly thinking into a complex, but practical, subject, and made the way smooth for further advances in the field.

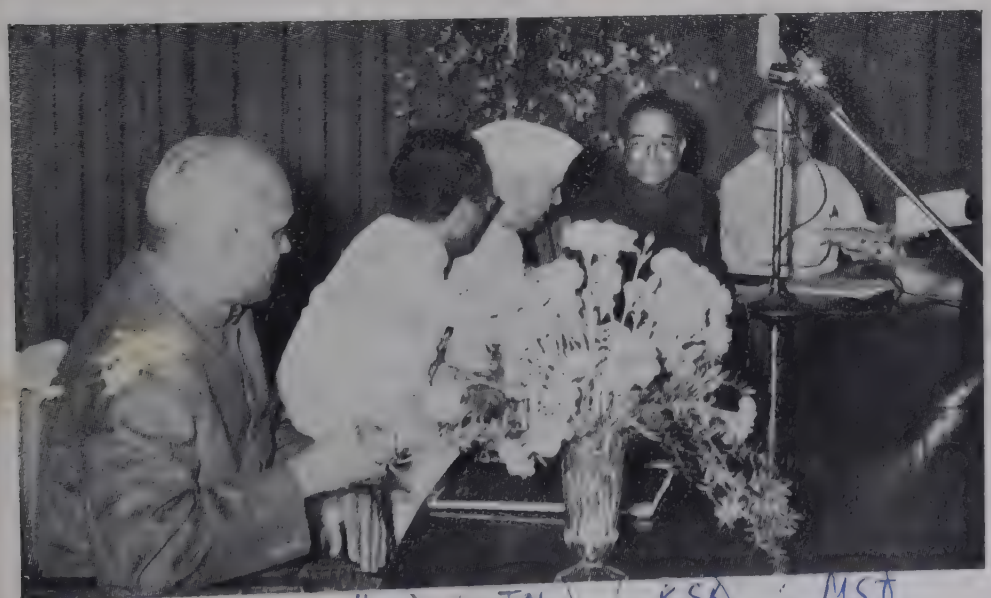
"Dr. Krishnan's researches are characterized by a combination of theoretical and experimental methods of approach, thoroughness and maturity of treatment, and elegance in the presentation of results.

"As the Senior Vice-President of the International Council of Scientific Unions he took a leading part in organizing the International Geophysical Year Programme.

"A scholar of distinction, well versed in classics, Dr. Krishnan attaches importance to the humanistic values of science, and the place of science in liberal education."

Dr. Krishnan thanked the council for the honour done to him. He

(*Contd. on p. 2, col. 3*)



(PMS) (HK) JN KSK MST

Presentation of the Bhatnagar Memorial Award by the Prime Minister to Dr. K.S. Krishnan

Prof. M. S. Thacker

Prof. M. S. Thacker, Secretary, Ministry of Scientific Research & Cultural Affairs and Director-General, Scientific & Industrial Research, left New Delhi on March 26, 1961 on tour to Switzerland, U.K. and U.S.A.

Prof. Thacker will arrive on March 27 at Zurich where he will meet the President, Swiss Foundation for Technical Assistance & Development and complete the formalities in respect of the Swiss assistance for the development of the Central Scientific Instruments Organization. He will reach Boston on April 2. He is one of the special invitees for the Centennial celebration of the Massachusetts Institute of Technology and the international conference which has been arranged. On April 9, Prof. Thacker will be in Washington and visit the National Academy of Sciences and the National Science Foundation and other scientific organizations. He will reach London on April 17. He will have consultations with the Commonwealth Scientific Committee of which he is the elected Chairman and proceed to Paris on April 23. At Paris, he will discuss with the Director-General, Scientific Research, France, regarding pilot plant developments and installations. He will also meet the experts of the French Institute of Petroleum with regard to the collaboration with the Indian Institute of Petroleum. He is expected to return to New Delhi on April 26, 1961.

* * *

Dr. K.S. Krishnan, Director, NPL, New Delhi, will look after the work of the Director-General, Scientific & Industrial Research during Prof. M. S. Thacker's absence abroad from March 26 to April 25, 1961.

CSIR to take over Central Board of Geophysics

(*Contd. from p. 1, col. 2*)

The Board of Scientific & Industrial Research and the Governing Body of the Council of Scientific & Industrial Research met in New Delhi on March 24 and March 25, 1961 respectively. The Prime Minister, Shri Jawaharlal Nehru, presided.

New Institutes, Units and Stations

The Governing Body approved the taking over from the Ministry of Scientific Research & Cultural Affairs the Central Board of Geophysics including its Geophysical and Oceanographic Research Wings with effect from April 1, 1961.

Establishment of Field Research Centres at Ahmedabad, Madras, Sindri and Kanpur and Field Units at Jabalpur and Trivandrum by the Central Public Health Engineering Research Institute, Nagpur, was approved.

Establishment of two sub-stations of the Coal Survey Station, Bilaspur, one at Baikunthapur in Bisrampur coalfield and the other in Singrauli coalfield has been sanctioned.

A project for installation and maintenance of 200 wind-mills on the design developed by the Wind Power Division of the National Aeronautical Laboratory, Bangalore was approved.

A scheme for commercial scale cultivation of *Mentha arvensis* (*Podina*) in 2,000 acres of land at Nandpur Farm, Jammu was approved. The scheme will be worked out by the Govt. of Jammu & Kashmir in collaboration with the Central Indian Medicinal Plants Organization.

Pilot Plants

Setting up of following pilot plants was sanctioned : (i) Beneficiation of low-grade manganese ores (capacity, 25-50 tons per day) at the National Metallurgical Laboratory, Jamshedpur; and (ii) Manufacture of methane from animal and vegetable waste (capacity, 1,000 cu. ft/ day) at the Central Fuel Research Institute, Jealgora.

Grants-in-aid

The Governing Body sanctioned grants-in-aid to 66 new research schemes (list given on pp. 3 & 4).

Symposia & Seminars

Approval was given to the holding of the following symposia, seminars and conference during 1961-62.

SYMPOSIA

1. *Ferro-alloy Industry in India*—National Metallurgical Laboratory, Jamshedpur.

2. *Cultivation & Utilization of Medicinal Plants in India*—Regional Research Laboratory, Jammu.

3. *Modern Trends in the Drug Therapy of Metabolic Disorders*—Central Drug Research Institute, Lucknow.

4. *Chemicals from Coal and Tar*—Central Fuel Research Institute, Jealgora.

5. *Mechanization of Mines in India*—Central Mining Research Station, Dhanbad.

6, 7 & 8. *Industrial Trade Wastes: Training of Public Health Engineers;* and *Biological Aspects of Water and Sewage Treatment*—Central Public Health Engineering Research Institute, Nagpur.

9. *Present Status of Drug Research in India*—Pharmaceuticals & Drugs Research Committee (to be held at the Central Drug Research Institute, Lucknow).

10. *Chemical Process Designing*—Chemical Research Committee (to be held at the Indian Institute of Science, Bangalore).

11. *Carbohydrates, Cellulose and Cellulose Industries*—Chemical Research Committee (to be held at the Ahmedabad Textile Industry's Research Association, Ahmedabad).

SEMINARS

12. *Electrochemistry* (third seminar)—Central Electrochemical Research Institute, Karaikudi.

13. *Vegetable Tannins*—Central Leather Research Institute, Madras.

14. *Cholera*—Indian Institute for Biochemistry & Experimental Medicine, Calcutta.

15. *Aeronautical Sciences*—National Aeronautical Laboratory, Bangalore.

CONFERENCE

16. *Solid State Physics* (third annual conference)—Physical Research Committee (to be held at Calcutta).

paid a tribute to the memory of Dr. Shanti Swarup Bhatnagar who, he said, was in a large measure responsible for the rapid growth of public support to science in the country. He then gave a resume of the research work carried out by him and his colleagues on the physics of solid state.

Prof. M. S. Thacker, Director-General, Scientific & Industrial Research congratulated Dr. Krishnan on behalf of the personnel of various laboratories and thanked the President, CSIR and other guests.

PERSONAL

●DRS. N.M. KHANNA & R.N. CHAKRAVARTI have been appointed, on promotion, Senior Scientific Officers: Grade I, CDRI, Lucknow, with effect from Feb. 20, 1961.

●DRS. D.C. DHAR, I.M. CHAK, V.K. MOHAN RAO, R.N. IYER, G.B. SINGH, R.N. SUR, C.L. MADAN, A.C. ROY & SHRI BALAKRISHNA have been appointed, on promotion, Senior Scientific Officers : Grade II, CDRI, Lucknow, with effect from Feb. 20, 1961.

●DR. GOVIND RAI CHOUDHRY, Junior Scientific Officer, NBG, Lucknow, has been appointed, Senior Scientific Officer: Grade II, CDRI, Lucknow, with effect from Feb. 20, 1961.

●SARVASHRI N. SEN & K.P. AGARWAL have been appointed, on promotion, Junior Scientific Officers, CDRI, Lucknow, with effect from Feb. 20, 1961.

●SHRI R.N. CHAKRABARTY has joined BITM, Calcutta, as Junior Technical Officer, with effect from March 1, 1961.

* * *

●DR. K.S. KRISHNAN, Director, NPL, New Delhi, has been renominated a member of the Standing Advisory Board for Astronomy, Ministry of Transport and Communications, New Delhi for three years.

●DR. B. MUKERJI, Director CDRI, Lucknow, has been nominated a member of the Editorial Board, *Indian Journal of Physiology and Pharmacology*, Bombay.

●DR. K. N. SINHA, Officer-on-Special Duty, CMRS, Dhanbad, or his nominee will represent the CMRS on the Advisory Committee on Stowing, Ministry of Steel, Mines and Fuel, New Delhi.

RESEARCH IN PROGRESS

National Laboratories

CFRI, JEALGORA

Nitrogen Instability and Rank of Coal—Investigations have been undertaken for establishing a relationship between the instability of nitrogen and the rank of coal. The instability factor is determined by evaluating the percentage of nitrogen evolved as ammonia to total nitrogen in coal (on dry basis). The instability factors of coals of different ranks were determined and plotted against the percentage of carbon. The graph showed that up to 86 per cent carbon content there is a gradual fall in the instability, after which it does not vary appreciably with the rank of coal. A maximum stability of 94 per cent nitrogen during pyrolysis is observed in coal with 86 per cent carbon.

On plotting the instability factor against the percentage of hydrogen, it is found that while the instability falls with increase in the percentage of hydrogen in lower rank coals (carbon, up to 86 per cent), it is fairly independent of the hydrogen content in higher rank coals—C. CHATTERJEE, A. K. GUPTA & S. GUPTA.

CFTRI, MYSORE

Carotenoid Pigments of Badami Mango—Absorption spectral studies have shown that considerable amount of carotenoid pigment, a rich source of β-carotene, of Badami mango is lost during canning of pulp and storage of canned product. Study carried out for the preservation of pulp pigment during processing has indicated that after partial neutralization of the acidity it can be utilized for the preparation of strained mango pulp and drum-dried mango custard powder. The colour of the canned pulp and custard powder is also not significantly affected during processing.

CRRI, NEW DELHI

Thixotropy of Indian Clays—Preliminary investigations have indicated exhibition of the phenomenon of thixotropy by certain Indian clays and silts. According to this phenomenon, remoulded samples of soils or silts gain strength with the lapse of time or by storage at unaltered moisture content.

The thixotropic effects are marked at high liquidity index of soil. Kaolin is the least thixotropic of the clays. But certain soils which do not exhibit thixotropy when treated with dilute solution of dispersing agents exhibit thixotropy.

Soils compacted at optimum moisture do not exhibit high thixotropy, but when the soils are under low strain, thixotropic effect is significant.

CDRI, LUCKNOW

Yeast Hydrolysate from Distillery Sludge—The nutritive value of yeast hydrolysate prepared from distillery sludge has been assessed by supplementation experiments using growing rats reared on a poor rice diet. Growth data and histopathological examination of livers indicate that besides supplementing the growth of rats on the poor rice diet, the yeast hydrolysate partially prevents histopathological changes in the liver of the animals receiving only poor rice diet.

Unesco Seminar on Scientific Documentation

A seminar on Scientific Documentation in South and South East Asia, sponsored by Unesco, was held at Insdoc, NPL Buildings, New Delhi during March 7-16, 1961. The seminar was inaugurated by Prof. Humayun Kabir, Minister for Scientific Research and Cultural Affairs. Shri P.N. Kirpal, Secretary, Ministry of Education, welcomed the participants from India and the following countries : U. S. A., U. S. S. R., France, Japan, Burma, Ceylon, Federation of Malaya, Indonesia, Mexico, Phillipines, Singapore, South Korea, Thailand, U.A.R., Nepal and Pakistan. Papers connected with the following aspects of scientific documentation were discussed at the seminar :

1. Position of scientific documentation in Asian countries
2. Techniques and principles of scientific documentation
3. Cooperation in scientific documentation between countries in South and South East Asia as well as other countries.

At the concluding session, proposals for the development and improvement of scientific documentation in the countries of South and South East Asia were considered and unanimously approved.

INSDOC, NEW DELHI—Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs, delivering the inaugural address at the Unesco Seminar on Scientific Documentation

BRIEFS

Agreement for Indo-Swiss Training Centre Signed

An agreement has been signed between the Swiss Foundation for Technical Assistance, Zurich and the Council of Scientific & Industrial Research for the establishment and operation of an Indo-Swiss Centre for training precision mechanics in the field of instrumentation. The Centre will function as part of the Central Scientific Instruments Organization.

Under the terms of the Agreement, the Swiss Foundation will provide free of cost to the CSIR, equipment worth about one and a half million Swiss francs and experts for a period of five to eight years. The total cost of this assistance will be about six million Swiss francs. The CSIR will be responsible for providing the building and necessary supplementary equipment and for meeting the recurring expenditure of the Centre and the local cost of the experts.

Shri P. M. Sundaram, Secretary, Council of Scientific & Industrial Research and Dr. Fritz Real, Director of the Swiss Foundation for Technical Assistance signed the agreement on behalf of the CSIR and the Swiss Foundation respectively. Prof. M. S. Thacker, Director-General, Scientific & Industrial Research and Dr. Schindler, President of the Swiss Foundation will sign the agreement at Zurich.

CSIR SECRETARIAT, NEW DELHI—Signing of agreement for Indo-Swiss Centre for training precision mechanics in instrumentation

Symposium on Light Metal Industry in India

The symposium on Light Metal Industry in India organized by the National Metallurgical Laboratory (NML), Jamshedpur during Feb. 14-17, 1961 was inaugurated by Prof. M. S. Thacker, Director-General, Scientific & Industrial Research. Shri Jehangir Ghandy, Chairman of the Executive Council, NML, presided.

Twenty-seven papers received from scientists, engineers and metallurgists from India and abroad, and covering the various aspects of research and development in light metal and alloys, their production and properties were presented and discussed in six technical sessions. The subjects largely covered by the papers related to (i) scope for research and development of light metals, (ii) studies and development on reduction and working of aluminium and its alloys, (iii) application of light metals, and (iv) some fundamental aspects of light alloys.

Dr B. R. Nijhawan, Director, NML, in welcoming the delegates, referred to the wide spectrum ranging from laboratory scale experiments to organized pilot plant scale production between research and development in light metal industry and described the role of NML in bringing about a vital link between these two ends of the spectrum.

Shri Jehangir Ghandy, in his presidential address, commended the good work done by the NML in the metallurgy of light metals and formulation of light metals and their alloys based on indigenous alloying elements such as aluminium, magnesium, and rare earth metals.

Prof. M.S. Thacker, in his inaugural address, stressed the need for comprehensive planning to raise the economy and standards and pleaded that serious thought should be given to integrate the survey of all the resources available in India.

Seminar on Fruit and Vegetable Preservation

The Central Food Technological Research Institute (CFTRI), Mysore participated in a seminar on Fruit and Vegetable Preservation organized at the Institute by the Indian Agricultural Research Institute during Feb. 13-16, 1961.

Of the 24 papers presented and discussed at the seminar, 10 were contributed by the staff of the CFTRI. Some of the important subjects discussed at the seminar are : Development and future scope of fruit and vegetable preservation industry in India, utilization of horticultural produce, storage and transport of fresh fruits and vegetables, processing techniques, quality control, export of preserved fruit products, preservatives, additives and colours, and fabrication of equipment and containers for the industry.

Research Papers

Use of sub-standard fuels in the iron and steel industry—M. S. Iyengar, CFRI, Jealgora, *J. Mines Metals Fuels*, **9** (1) (1961), 1-3.

Unsaturation in coal—J.N. Bhaumik, A. Lahiri & P. N. Mukherjee, CFRI, Jealgora. *Chem. & Ind.*, (1960), 1998-1999.

Study of flow properties of some Indian china clays—S. Sen & S.K. Guha, CGCRI, Calcutta. *Trans. Indian ceram. Soc.*, **19** (1960), 87-97.

Optical absorption spectra of solarized Mn^{3+} and V^{2+} ions in glass—S. Kumar & Purabi Sen, CGCRI, Calcutta. *J. Soc. Glass Tech.*, **1**, (1960), 165-180.

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CSIR NEWS

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Committee for Underground Gasification of Coal

A Technical Committee has been constituted to examine the feasibility of underground gasification of coal for generation of power, to locate suitable areas where this could be tried on a commercial scale, and to work out the economics of the proposal. The members of the committee are : SHRI A.B. GUHA, Coal Mining Adviser, Ministry of Steel, Mines and Fuel, New Delhi (*Chairman*) ; DR. A. LAHIRI, Director, CFRI, Jealgora; DR. J.W. WHITAKER, Director, IIP, Dehra Dun; SHRI M.K. GOPALIENGAR, Director (Power), Planning Commission, New Delhi; PROF. M.V. KAMLANI, Head of the Mechanical Engineering Department, University of Roorkee, Roorkee; and SHRI K.N. SINHA, Officer-on-Special Duty, CMRS, Dhanbad (*Convener*).

Lectures for Refinery Engineers

A two-month course of lectures, arranged at New Delhi by the Indian Institute of Petroleum for the engineers of the Barauni refinery (to be set up in Bihar by the Government of India), will be inaugurated by Shri P. R. Nayak, Managing Director, Indian Refineries Ltd., New Delhi on April 17, 1961. The course has been instituted to give instructions to the engineers, who later will go to Russia for training, on processes and techniques used in refinery. Experts of private refineries will also deliver lectures during the period of course.

P E R S O N A L

●DR. S.G. BHATTACHARYA has joined the CMERI, Durgapur, as Senior Scientific Officer : Grade I, with effect from March 20, 1961.

●DR. P.K. SAHA has been appointed Senior Scientific Officer : Grade II, CGCRI, Calcutta, with effect from March 7, 1961.

●SHRI K.R. BULUSU has been appointed Senior Scientific Officer : Grade II, CPHERI, Nagpur, with effect from March 7, 1961.

●SHRI J.B. SAHA has joined CMERI, Durgapur, as Clerk of Works with effect from Jan. 6, 1961.

●SHRI P.B.V. MENON has been appointed Accounts Officer, CMERI, Durgapur, with effect from Feb. 15, 1961.

●SHRI R. SRINIVASA RAO has been appointed Accounts Officer, NML, Jamshedpur, with effect from March 8, 1961.

●SHRI M.S. RAO has been appointed, on promotion, Stores Officer, CMERI, Durgapur, with effect from Feb. 25, 1961.

●SHRI N.B. PANJWANI, Senior Scientific Officer : Grade Ii, CMERI, Durgapur, relinquished charge of his post on March 10, 1961,

* * *

●DR. A.P. MITRA, Asst. Director, NPL, New Delhi, left for Italy on April 6, 1961 for attending the General Assembly of the Committee on Space Research and to participate in the Second International Space Science Symposium to be held at Florence (April 7-18, 1961).

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●DR. ATMA RAM, Director, CGCRI, Calcutta, has been nominated a member of the Standing Committee of the National Institute of Sciences of India, for organization of symposia for 1961.

●SHRI V. CADAMBE, Director, CMERI, Durgapur, has been elected President of the Section of Engineering & Metallurgy, Indian Science Congress Association for 1961-62.

●DR. K. N. SINHA, Officer-on-Special Duty, CMRS, Dhanbad, has been nominated a member of the National Mine Safety Council, Ministry of Labour and Employment.

●DR. N.G. BASAK, Deputy Director, CFRI, Jealgora, has been elected a Fellow of the Institute of Fuel, U.K.

Open Day at RRL, Jammu

April 16, 1961 will be observed as an Open Day by the Regional Research Laboratory, Jammu Besides displaying the scientific achievements of the Laboratory the medicinal plants garden will also be opened to the public.

●The following officers have been nominated members of the Committee/Panel of the Indian Standards Institution :

DR. S. SEN (Principal Member) and SHRI B.K. AGARWAL (Alternate Member), Senior Scientific Officers, CGCRI, Calcutta—*Methods of Chemical Analysis Sectional Committee.*

DR. V. NARASIMHAN (Principal Member) and SHRI R.C. JAIN (Alternate Member), Senior Scientific Officers, CBRI, Roorkee—*Daylight Standards Sub-Committee.*

DR V. NARASIMHAN, Senior Scientific Officer, CBRI, Roorkee—*Heat and Sound Insulation Sub-Committee.*

SHRI K.R. RAO, Senior Scientific Officer, CBRI, Roorkee—*Orientation & Ventilation Sub-Committee*

SHRI S.B. ROY, Senior Scientific Officer, CGCRI, Calcutta—*Mica Sectional Committee.*

SHRI J.S. SHARMA, Junior Scientific Officer, CBRI, Roorkee—*Central Zone Sub Committee.*

* * *

●SHRI J.S.S. LAKSHMINARAYANA, Junior Scientific Officer, CPHERI, Nagpur, has been awarded the Ph. D. degree by the Banaras Hindu University for his thesis, *Phytoplankton of the River Ganges.*

●SHRI P.R. DAS GUPTA, Junior Scientific Officer, CDRI, Lucknow, has been awarded the D. Phil degree by Calcutta University for his thesis relating to Demonstration of the existence of precorticotrophin, growth hormone and respiratory quotient and structure of palladium diamidoxime complex and estimation of palladium.

BRIEFS

Storage Battery Technology

The seven-week course on Storage Battery Technology organized by the Central Electrochemical Research Institute, Karaikudi, ended on March 23, 1961. Representatives of the following organizations attended the course : (1) Tata Institute of Fundamental Research, Bombay ; (2) Hindustan Aircraft Ltd., Bangalore ; (3) The Mysore Electrochemical Works Ltd., Bangalore ; (4) Gyro Laboratories Private Ltd., Bombay; (5) Globe Engineering Corporation, New Delhi; and (6) Laxmi Transport Co., Palitana.

Prof S. Tajima of the Tokyo Metropoliton University and a renowned electrochemist of Japan distributed certificates to the representatives on completion of the course at a special function held at the Institute on March 23, 1961.

CRRI, New Delhi

The Central Road Research Institute, New Delhi arranged training in First Aid to the injured for the staff of the Institute in collaboration with St. John Ambulance Association (India), New Delhi. The object of the training was to train the staff members so that they may render first aid to the injured at the time of accidents which occur in the workshop and various divisions of the Institute.

The training course in three groups started in October, 1960 and was concluded in December, 1960. Of the 88 members of the Institute who undertook training, 73 were declared to have completed the course successfully.

Prof. S. R. Mehra, Director, CRRI, awarded the certificates to members who successfully completed the course at a special function held at the Institute on March 15, 1961.

BITM, Calcutta

A demonstration model of the RD type Marine Diesel Engine has been presented to the BITM, Calcutta by *Sulzer Brothers Ltd.*, Winterthur, Switzerland. The model was handed over by Mr. A. A. Reinhart, Chief Engineer of the firm to Shri A. Bose, Planning Officer, BITM, at a ceremony held at the Museum on Feb. 23, 1961.

Research Schemes Terminated

The following research schemes have been terminated with effect from Feb. 28, 1961.

Physical Research

1. *Breakdown studies in a microwave gas discharge plasma and other collision process in gas and solids*—Dr. M. P. Madan, Lucknow University, Lucknow.

2. *Study of low angle X-ray scattering of natural and synthetic fibrous material*—Prof. K. Banerjee, Indian Association for the Cultivation of Science, Calcutta.

3. *Relaxation times of element in liquid medium*—Dr. S.N. Ghosh, Allahabad University, Allahabad.

4. *Measurement of ultrasonic absorption in liquid under varying conditions*—Prof. A.K. Dutta, Ravenshaw College, Cuttack.

Chemical Research

5. *Solvent effect in nucleophilic aliphatic substitution*—Dr. R. Anantharaman, University of Kerala, Trivandrum.

6. *Synthesis of silicon analogues of terpenes and polycyclic hydrocarbons*—Dr. S.V. Sunthankar, University of Bombay, Bombay.

7. *High frequency titrations*—Prof. S. N. Mukherjee, Jadavpur University, Calcutta.

8. *Study of the budde effect on halogens under electric discharge*—Dr. H. J. Arnikar, Banaras Hindu University, Varanasi.

9. *Stereochemical studies in cyclopeptane series*—Dr. G. S. Saharia, Delhi University, Delhi.

10, 11 & 12. Physicochemical studies on Indian silk ; Chemical properties of polymers analogues *to muscle; and Quantum mechanics of molecular interaction*—Dr. S. Basu, Indian Jute Mills' Association Research Institute, Calcutta.

13. *Study of the structure of adsorbed materials on textile fibres by small angle X-ray scattering*—Dr. T. Radhakrishnan, Ahmedabad Textile Industry's Research Association, Ahmedabad.

Biological Research

14. *Cytology and taxonomy of the mosses in Calcutta and its neighbourhood*—Shri H.C. Gangulee, Presidency College, Calcutta.

15. *Study of the algae of the soils of U. P.*—Dr. A. K. Mitra, University of Allahabad, Allahabad.

16. *Cyto-ecological studies on the mangrove flora of India*—Dr. R. P. Patil, Central Botanical Laboratory, Allahabad.

Pharmaceuticals & Drugs Research

17. *Pharmacological research unit at Ahmedabad*—Dr. G. K. Karandikar, B. J. Medical College, Ahmedabad.

Electrical & Mechanical Engineering Research

18. *Multipurpose two stroke engine*—Shri N. N. Narayana Rao, Madras Institute of Technology, Madras.

Civil Engineering & Hydraulic Research

19. *Mechanics of sediment transportation*—Shri Visweswara Rao, Indian Institute of Technology, Kharagpur.

20. *Investigation for improving the quality of bricks*—Shri N. N. Majumdar, Road and Building Research Institute, Calcutta.

21. *Investigations aimed at establishing standard welding procedures and improved methods of testing weld test specimens*—Shri M. N. Saxena, Roorkee University, Roorkee.

Dr. J. S. Ahluwalia

Dr. Joginder Singh Ahluwalia has been appointed Officer-on-Special Duty, Indian Institute of Petroleum with effect from Jan. 4. 1961.

Dr. Ahluwalia (*b.* Sept. 28, 1925) M. Sc. (Tech.) Panjab University, 1949, worked in the Heat & Power Division, NPL, New Delhi (1951-54) In 1954, he left for higher studies and training at the Institute Francais Du Petrole, Paris. He graduated as Research Engineer from Ecole Nationale Superieu du Petrole et des Moteurs and got his doctorate degree (Ingenieur Docteur) from the Paris University in 1957. He also had training in the Engineering Department of the Institute Francais Du Petrole and at the Kent Oil Refinery, Isle of Grain and British Petroleum Research Centre at Sunbury-on-Thames, England. In 1958, he returned to India and joined the Department of Mines and Fuel (Ministry of Steel, Mines and Fuel), New Delhi as Chemical Engineer where he has been connected with the planning of refineries in the public sector.

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Heating Elements—Studies have been in progress for developing substitutes for electrical resistance alloys which are imported for use in domestic and industrial heating (*CSIR NEWS*, Vol. 10, No. 17, p 3). Compositions and mechanical working techniques of the alloys have been developed. It has been found that the iron-base low-chromium high-aluminium alloys with suitable additions of Misch metal and/or zirconium impart good workability and high temperature scaling resistance to the alloys. Accelerated life tests of these alloys have shown much greater life at 1150° and 1200°C, as compared to nichrome heating element.

CDRI, LUCKNOW

Peptic Ulcers—Experimental studies on the effect of phenylbutazone on mucous barrier in relation to peptic ulceration in guinea pigs have been carried out. Oral administration of phenylbutazone (100 mg./kg.) over a period of 30 days gradually destroyed mucous barrier. There was steady decrease of mucin in the gastric juice which was highly significant (99% level of significance) and depletion of mucin from mucous cells. The peptic activity and volume of gastric juice were not significantly changed during the course of experiment. Free acid showed slight increase followed by a decrease up to 30 days of drug feeding. Prolonged feeding of the drug produced well-defined deep chronic ulceration of the stomach in guinea pigs. In the absence of an efficient mucous barrier, the corrosive action of free acid possibly keeps the ulcers in a chronic stage.

IIBEM, CALCUTTA

Metabolism of Arterial Wall of Rabbits—Cholesterol feeding to rabbits produces atherosclerotic changes only in the pulmonary artery, ascending aorta and arch of aorta, while the other portions of the arterial system remain unaffected. In view of this finding studies on the metabolism of different segments of the arterial tissue of normal and atherosclerotic rabbits have been undertaken.

The QO_2 (µl. of oxygen uptake per mg. dry wt per hr) of the arterial tissue of adult rabbits has been found to be between 0.4 and 0.9. No difference in the QO_2 has been observed in different portions of the arterial system. Addition of glucose, citrate, fumerate and pyruvate does not increase the rate of respiration but when succinate is added the rate of respiration is increased to about 4 to 6 times the initial level—D. P. CHATTOPADHYAY.

CMRS, DHANBAD

Methane Indicator—A methane indicator which can estimate viscometrically methane in a methane-air mixture in the range of 0-100 per cent with an accuracy of $\pm$ 1 per cent has been constructed.

Carbon Monoxide Detector Tube—A process for the preparation of glass tubes for detecting carbon monoxide in air has been developed utilizing indigenous products. The process is less time consuming as compared to conventional methods and the tubes can detect carbon monoxide present in air up to 10 p.p.m.

Sponsored Research

Flotation of Sulphide Minerals—The action of xanthate collectors at sulphide mineral surfaces during flotation has been under investigation. The effect of air, oxygen and carbon dioxide and their mixtures on adsorbed films of collector at chalcopyrite surface and its flotation from the ore has been studied. The collectors used were ethyl, isopropyl and isoamyl xanthates. The effect of various gaseous systems on the surface, activated by treatment with copper sulphate solution, was studied by measuring the contact angle by the captive bubble method.

Ethyl xanthate adsorbed at chalcopyrite surface does not undergo any oxidation, while isopropyl xanthate is slightly oxidized in presence of mixture of air and carbon dioxide and of oxygen and carbon dioxide. Isoamyl xanthate is oxidized in the case of all the gaseous systems. The results show that aeration of the flotation pulp may improve the flotability of chalcopyrite since the adsorbed film of higher xanthates is oxidized to that of the corresponding dixanthogen thereby providing greater hydrophobicity to the mineral.

Using a low grade chalcopyrite obtained from Indian Copper Corporation, Ltd, Ghatsila (Bihar), the effect of passing these gases on flotation has been studied. Ethyl xanthate gives lower recovery but higer grade of chalcopyrite in presence of air; both the recovery and grade improve in presence of oxygen. In the presence of air and carbon dioxide, the recovery improves but the ore obtained is slightly inferior. In the case of isopropyl xanthate, aeration causes little improvement in the recovery when oxygen, air plus carbon dioxide or oxygen plus carbon dioxide are used, while the grade remains unchanged. With amyl xanthate, the recovery is 100 per cent but the grade of ore is poor as compared to other xanthates.

In general, the above results show that aeration helps in reducing the amount of xanthate required for flotation—S. R. RAO, Junior Research Fellow, Indian Institute of Science, Bangalore.

Research Papers

A study of the effect of various flocculating agents on coal washery slurries—J. Chattopadhyay, A.K. Chakravarti, G G.Sarkar & A. Lahiri, CFRI, Jealgora. *J. Mines Metals Fuels*, **9** (2) (1961), 4-10.

An improved device for float and sink tests of coal below $\frac{1}{8}$ in.—G.G. Sarkar & S. Manchanda, CFRI, Jealgora. *Gluckauf*, **97** (1961), 204-206.

X-ray diffraction studies on building materials during 1958-59—A.K. Chatterjee & K.D. Dhariyal, CBRI, Roorkee. *J. nat. Build. Organ.*, **5** (1961), 3-12.

A water tube level—Dinesh Mohan & Giriraj Singh Jain, CBRI, Roorkee. *J. nat. Build. Organ.*, **5** (1961), 25-28.

An investigation for evaluating an airfield pavement—H. L. Uppal & H.S. Bhatia, CRRI, New Delhi. *J. Indian Roads Congr*, **25** (1961), 25-16.

Some preliminary trials for the improvement of wood tar for use in low-cost road construction—H.L. Uppal & L.R. Chadda, CRRI, New Delhi. *J. Indian Roads Congr.*, 25 (1960), 187-192.

In Parliament

Area Integrator—Shri Humayun Kabir, Union Minister for Scientific Research and Cultural Affairs, in reply to a question by Shri Bibhuti Mishra affirmed in the Lok Sabha that a new instrument, Mechanical Area Integrator, for measuring the area of mine roadways has been designed at the Central Mining Research Station, Dhanbad.

The Minister said that the instrument could measure irregular areas of mine roadways and is thus useful in the mining industry. It could also be used for other purposes where the measurement of areas of irregular shapes was needed (*April 5, 1961*).

Dr. Kurt Wolf

Dr. Kurt Wolf, Unesco Expert on leather industry has been assisting the Central Leather Research Institute, Madras since July 1960 in production of industrial leathers.

Dr. Wolf (*b.* Sept. 1902, Frankfurt, W. Germany) educated at Mainz and Darmstadt (Technische Hochschule), Dipl. Ing. (1925) and Dr. Ing. (1927), was Head of the Laboratory Division and Assistant to the Technical Management of M/s Lederwerks S. Hirsch at Weinheim (1927-31), Scientific Officer and Chief of the Technical Department of the Institute for Leather Chemistry and Technology, Darmstadt (1932-49), and also Secretary-General of the International Society of Leather Industries Chemists and Editor of 'Collegium' (1932-45), and Technical Manager of M/s Leder and Co., Rapperswil, Switzerland and M/s Origin Ropp S. P. A., Gozzano, Italy (1949-58). Since 1958 he was sole owner of the Advice and Research Bureau for Leather Industry, Rapperswil.

PATENTS & PROCESSES

Applications Filed

INDIA

74596 : *A process for the production of middle distillates such as illuminating fuels (kerosene substitutes), and diesel fuels from coal-tar and fractions thereof*—M.G. Krishna, R. Vaidyeswaran, B.N. Rao, M.J.A. Khan & S.H. Zaheer, RRL, Hyderabad.

75699 : *Improvements in or relating to the conversion of total bile acids into lithocholic acid*—P.N. Rao, NCL, Poona.

Applications Accepted

INDIA

67476 : *A process for the conversion of coal and lignite into smokeless fuel*—S.S. Choudhury, B.K. Mazumdar, S.K. Chakrabartty & A. Lahiri, CFRI, Jealgora.

67664 : *Separation of soluble silica from alkaline solution*—A.V.R. Rao, D.S. Datar & S.H. Zaheer, RRL, Hyderabad.

68171 : *Compositions and methods of making welding flux*—M.R. Rao, N.V. Naidu & H.V. Bhaskar Rao, NML, Jamshedpur.

69325 : *A Process for stabilization of physostigmine (Eserinum) sulphate*—M.B. Naidu & S.H. Zaheer, RRL, Hyderabad.

69986 : *Improvements in or relating to aluminium paints*—Atma Ram, S.B. Roy & H.D. Sarker, CGCRI, Calcutta.

GERMANY

C 18,983 IVb/120 : *A process for the preparation of dihydrojasmone*—J.H. Amin & S.C. Bhattacharyya, NCL, Poona.

Applications Sealed

66175 : *A process for the oxidation of* ortho-, meta-, *and* para- *xylenes and mixed xylenes to the corresponding tolualdehydes*—H. V. Udupa & M.S. Venkatachalapathi, CECRI, Karaikudi.

66196 : *A process for the isolation of new cardiac glycosides from the seeds of* Thevetia neriifolia *Juss.*—S. Rangaswamy & E.V. Rao, Andhra University, Waltair.

Processes Ready for Exploitation

BENZYL CHLORIDE

The Regional Research Laboratory, Hyderabad has developed an improved process (Indian Pat. No. 71864) for the preparation of benzyl chloride from toluene and chloride. Pure benzyl chloride with a yield of up to 90 per cent of the theoretical has been achieved by this process.

The process has been successfully tried on a pilot plant (capacity, 15 kg. of benzyl chloride per batch) and economic data for designing commercial unit have been collected. Total capital outlay for a plant having a capacity of 600 kg. per day is estimated at about Rs. 5.25 lakhs.

Parties interested in taking up the commercial development of the process may write to the Secretary, National Research Development Corporation, Mandi House, New Delhi.

PASTEURIZER FOR CANNED ACID FOOD

The Central Food Technological Research Institute, Mysore has developed a cheap batch type agitating cooker (Indian Pat. No. 69697) for processing canned fruits, fruit juices and fruit pulps, fruit juice concentrates and soups. The cost of the cooker is about one-fourth of similar imported equipment.

In this cooker, hermetically sealed cans containing acid foods rotate axially in steam at atmospheric pressure for an appropriate time, followed by spin cooling under sprays of water within the cooker.

The cooker can process a varied range of canned acid food of different viscosities in shorter time. A variety of products processed in a prototype cooker have stood the storage tests for 6-12 months at 30°C.

Parties interested in taking up the commercial development of the process may correspond with the Secretary, National Research Development Corporation, Mandi House, New Delhi.

Prof. H. W. Baker

Prof. H. Wright Baker, Chief UNTAB Consultant, who had been working at the CMERI, Durgapur (*CSIR NEWS*, Vol. 19, No. 23, p. 1) left the Institute on Feb. 28, 1961, after completion of his assignment.

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CSIR NEWS

VOL. II 1st 5.61 NEW DELHI—APRIL 24, 1961 : VAISAKH 4, 1883 No. 8

INDIAN MADE GAS TURBINE ENGINE

A gas turbine engine of unique design, suitable for high speed aircraft, has been designed and fabricated by the Gas Turbine Research Centre, Kanpur. The engine was switched on April 8, 1961.

The turbine is capable of 13,300 revolutions per minute and has a thrust rating of 2,200 lb. A special feature of the engine is the annular combustion chamber, which has been incorporated for the first time in a centrifugal gas turbine. The engine is simple in design, and its components can be made with conventional machine tools.

The Gas Turbine Research Centre was established by the Council of Scientific & Industrial Research at the Air Force Maintenance Centre, Kanpur, in 1958 in collaboration with the Defence Research & Development Organization of the Ministry of Defence in order to make a start on studies, experimentation and research pertaining to design, performance, material and development of gas turbine engines and their components. The Council sanctioned a block grant of Rs. 8 lakhs to the Centre for the period 1958-61 to meet the cost of equipment and recurring expenditure. Administrative assistance and service personnel for the Centre were provided by the Defence Research Organization.

MEETINGS

A meeting of the Executive Council of the *National Botanic Gardens*, Lucknow, will be held in the Conference Room of the New Building of the Gardens on May 7, 1961, at 11.00 a.m. Shri C.B. Gupta, Chief Minister, Uttar Pradesh, will preside.

A meeting of the Planning Committee of the *Birla Industrial & Technological Museum*, Calcutta will be held at the Museum on May 15, 1961 at 9.30 a.m. Dr. B.C. Roy, Chief Minister, West Bengal, will preside.

Manufacture of Chrome and Mordanted Crusts

A practical demonstration of the process for the manufacture of chrome crust and mordanted crust from wet-salted goat skin worked out at the *Central Leather Research Institute*, Madras will be held at the Institute from May 22 to June 15, 1961. Representatives of tanneries and leather industry who wish to attend the demonstration may send the particulars to the Director, LRI, Madras.

Dr. A.N. Kappanna

Dr. A. N. Kappanna has been appointed, on promotion, Director, CSRI, Bhavnagar, with effect from March 29, 1961.

Born at Chintamani, (Mysore State) in 1900, Dr. Kappanna graduated from Mysore University (1920) and obtained his M. Sc. degree from Dacca University (1923). The same year he joined the Dacca University as lecturer and in 1929 got his D.Sc. degree from the same University for his thesis : Kinetics of Ionic Reactions, under the guidance of the late Dr. J. C. Ghosh. During 1929-55 he was in the C. P. and Berar Education Service, first as Assistant Professor and later as Professor of Chemistry and Head of the Department of Chemistry, College of Science, Nagpur. In 1955 he joined the Shri Venkateshwara University, Tirupati as First Professor & Head of the Department of Chemistry and was there for about two years. He joined CSIR in January 1957 as Assistant Director, CECRI, Karaikudi and was transferred in May 1957 to CSRI, Bhavnagar as Assistant Director-in-Charge.

Dr. Kappanna's special field of study is photo-chemistry, chemical kinetics and electrochemistry and has to his credit about 50 papers.

Dr. Kappanna is a foundation fellow of the Indian Chemical Society and Indian Academy of Sciences. He is a member of the Council of Indian Chemical Society and Associate Editor and Editor of the *Journal of the Indian Chemical Society*.

Joint Committee for Scientific Research and Industry Reconstituted

The Vice-President, CSIR, has been pleased to reconstitute the Joint Standing Committee for Scientific Research and Industry. The Committee was constituted by CSIR in 1956 with a view to maintaining close and effective coordination and liaison between the Development Wings of the Ministry of Commerce & Industry and the CSIR. The members of the reconstituted Committee are : Shri Manubhai Shah, Minister for Industries (*Chairman*); Prof. M.S. Thacker, Director-General, Scientific & Industrial Research; Dr. B.D. Kalelkar, Senior Industrial Adviser (Engng), Ministry of Commerce & Industry; Dr. G.P. Kane, Senior Industrial Adviser (Chemicals), Ministry of Commerce & Industry ; Development Commissioner, Small-Scale Industries; Dr. K. Venkataraman, Director, NCL, Poona; Dr. Atma Ram, Director, CGCRI, Calcutta; President, Federation of Indian Chambers of Commerce, New Delhi; President, All-India Manufacturers' Organization, Bombay; Dr. D. Banerji, C/o National Rubber Manufacturer's Ltd., Calcutta; Shri K.K. Birla, Calcutta ; and Shri P. R. Ramakrishnan (Member of Parliament), Coimbatore.

BRIEFS

Foundation Stone of RRL, Jorhat Laid

Prof. Humayun Kabir, Union Minister for Scientific Research & Cultural Affairs and Vice-President, CSIR, laid the Foundation Stone of the Regional Research Laboratory, Jorhat (Assam) on March 18, 1961. Shri B. P. Chaliha, Chief Minister of Assam, presided at the function which was attended by over 2,000 persons.

Prof. M. S. Thacker, Director-General, Scientific & Industrial Research, in his welcome address stated that the Laboratory would help in the development of potentialities of Assam and in solving growing problems of the north-eastern region. He thanked the State Government for providing necessary facilities of land. Shri B. P. Chaliha in his address, expressed gratitude on behalf of the Government and people of Assam to Prof. Kabir, Prof. Thacker and the CSIR for setting up the Laboratory.

Prof. Humayun Kabir in the course of his address, stressed on the scientific and technological revolution needed to promote industrial, social, political and economic life of Assam and its adjacent areas.

Dr. B. N. Mitra, Director, RRL, Jorhat, thanked the Vice-President, Director-General and other guests.

Foundry Moulding Sands of India

This 180 page monograph, just published, records the results of comprehensive study of Indian foundry moulding sands and bonding materials carried out by the National Metallurgical Laboratory, Jamshedpur (Authors : Jatinder Mohan, R. M. Krishnan, B. R. Nijhawan, P. K. Gupte & B. V. Somayajulu).

The monograph is divided into two parts. Part I (four chapters) gives the occurrences in India of different types of sands and bonding materials, basic characteristics responsible for their working properties, and methods of their testing.

Part II of the monograph (six chapters) deals with experimental results and presents petrological and chemical composition, fineness, and moulding and casting characteristics of 42 samples of sands (natural sands, 20; crude silica sands, 11; high silica sands, 10; and special zircon sand, 1 sample) collected from various parts of the country. Chemical analysis and bonding characteristics of 4 bentonite clay samples have been recorded in a separate chapter. In the last chapter of the monograph, recommendations for utilization of various sand samples in mouldings of different metals and alloys are presented in tabular form. The publication contains 147 tables of data, 43 illustrations and 16 plates.

Copies of the publication (price, Rs. 15) are available from the Under Secretary, Publications Directorate, CSIR, Rafi Marg, New Delhi-1.

Symposium on Redox Processes

The symposium on Redox Processes organized by the Chemical Research Committee of the CSIR in the Department of Chemistry, University of Allahabad during Feb. 1-2, 1961 was inaugurated by Dr. Sri Ranjan, Vice-Chancellor of the University. Prof. B.C. Guha, Chairman, Chemical Research Committee presided over the inaugural session.

Forty-two research papers received from scientists from India and abroad were presented and discussed in the three sessions : (i) Electrode processes, (ii) Reactions in solution, and (iii) Analytical applications.

The following special lectures were delivered in three sessions : Redox processes with special reference to the reduction of permanganate and dichromate (Prof. S. Ghosh) ; Redox initition of polymerization (Prof. S. R. Palit) ; and Complex formation and its influence on redox processes (Prof. G. Gopala Rao).

Training Course in Electroplating

The fourth session of the three-month course of training in Electroplating organised by the Central Electrochemical Research Institute, Karaikudi was inaugurated on April 10, 1961, by Dr. A. Weiber, Chief Medical Officer, Swedish Mission Hospital, Tiruppattur, Ramnad Dt.

Prof. Kabir visits National Laboratories

Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs and Vice-President, CSIR, visited CMRS, Dhanbad, NML, Jamshedpur, and CFRI, Jealgora on April 3, April 4, and April 5, 1961 respectively. At CMRS he was taken round the Station by Dr. K. N. Sinha, Officer-in Charge and Shri S. Bagchi, Deputy Director. The various items of research shown to him include demonstration of testing of flame proof equipment and intrinsic safety at the Field Testing Laboratories of the Station. Prof. Kabir addressed the members of the staff at the end of his visit.

During his visit to NML, Dr. Nijhawan, Director, explained to him various research and development projects under way at Laboratory including pilot plants for the beneficiation of iron ores and sinter studies, aluminizing of steel wire and production of electrolytic manganese and manganese dioxide and pilot low-shaft furnace for producing iron utilizing non-coking coals. Prof. Kabir in the course of his address to staff of the Laboratory referred to the useful services of NML to the metal industry in the public and private sectors.

Addressing the staff of the CFRI, Prof. Kabir stated that science and technology are the means to create conditions under which the people of India will not suffer from want. Culture, he added, could flourish on the basis of science and technology.

PERSONAL

●SHRI A.C. KHAZANCHI has been appointed Clerk-of-Works, RRL, Jorhat, with effect from March 13, 1961.

●DR. A. GUHA has been appointed Senior Scientific Officer : Grade II, IIBEM, Calcutta, with effect from April 10, 1961.

●DR. (Miss) A. THANGAMANI, Senior Scientific Assistant, NCL, Poona, has been appointed Junior Scientific Officer, IIBEM, Calcutta, with effect from April 1, 1961.

●SHRI N. SATYANARAYANA SWAMI, Civil Engineer, CSIR, New Delhi, relinquished charge of his post on April 12, 1961.

(Contd. on p. 4, col. 1)

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Kankauli Chromite Ores—Beneficiation studies have been carried out on a low-grade chromite sample (assaying Cr_2O_3, 34.72; FeO, 21.5; Al_2O_3, 14.74; SiO_2, 9.6; MgO, 17.21; CaO, 2.0 and soluble iron, 0.76 per cent) from Kankauli deposits, Ratnagiri Dt., Maharashtra State.

Tabling the ore at 48 mesh size produced concentrate assaying 49.61 per cent Cr_2O_3 and 28.72 per cent FeO (Cr/Fe ratio, 1.52) with a recovery of 91.2 per cent Cr_2O_3.

Iron content of the sample could not be appreciably lowered by magnetic separation due to its chemical combination with chromite mineral, indicating that metallurgical grade of concentrate cannot be produced from this sample by the established ore-dressing method.

Concentrate suitable for refractory and chemical industries can, however, be produced employing simple gravity methods of concentration.

CFRI, JEALGORA

Flocculating Agents for Washery Slurries—For efficient and economic operation of coal washing plants, the fine coal and clay slimed in the circulating water are to be separated and recovered and the water is to be clarified for reuse. This is done in thickeners using flocculating agents which enhance the settling rates of solids and help to maintain a closed-water circuit.

Investigations were carried out for determining the effectiveness of different types of flocculants (Aerofloc, Separan, Sedipur reagents, starch, various electrolytes, etc.) for clarifying coal slurries and the optimum conditions under which the best results are obtained. The slurries for experiments were obtained from commercial washeries and CFRI pilot washery.

The studies have led to the following conclusions: (i) Synthetic flocculants in small doses are more effective in improving the sedimentation rates than common electrolytes, (ii) of the synthetic flocculants, Aerofloc 3000, and 3100, Separan 2610 and Sedipur AD4 are most effective in improving the settling rates; causticized starch is equally effective but when added in higher doses; (iii) use of synthetic flocculant in combination with common electrolytes like lime, aluminium sulphate or ferrous sulphate shows no improvement; (iv) for efficient clarification, the solid concentration of the incoming feed of slurry to thickener should not normally exceed the optimum concentration of 60-100 g./l.; this limit is dependent on the size, composition and nature of the slurry; (v) *p*H of the washery water influences the settling rate of solid particles in the process of clarification; synthetic flocculants remain active over a wide range of *p*H—J. M. Chattopadhyay, A.K. Chakravarti, G. G. Sarkar & A. Lahiri.

CGCRI, CALCUTTA

Refining of Glass—Elimination of small gaseous inclusions or seeds from molten mass of glass is important in glass manufacture.

The distribution of seeds in a typical soda-lime glass composition melted in pots at different temperatures and for different periods was studied utilizing statistical techniques. The study has shown that the refining period consists of three stages, each stage having characteristic distribution of seeds. Effect of time, temperature of melting and of different refining agents on relative duration of the three stages has been studied.

NAL, BANGALORE

WP-2 Type Windmill—A WP-2 type windmill, designed by the Wind Power Division of the National Aeronautical Laboratory, Bangalore, has been installed and put to operation on a well at Jambhulni, North Satara Dt., Maharashtra State for pumping water for drinking purposes.

CMRS, DHANBAD—Testing of helmets, flame safety lamps and illumination meter used in mines being explained to Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs, during his recent visit.

Research Papers

Aconitate isomerase—M.R.R. Rao & (Mrs) W.W. Altekar, NCL, Poona. *Biochem. biophys. Res. Commun.*, **4** (1961), 101.

Cation exchange behaviour of barium on Dowex 50W X8: Separation from mixtures—S.M. Khopkar & A.K. De, Jadavpur University, Calcutta. *Analyt. chim. acta*, **23** (1960), 441-45.

Thenoyltrifluoroacetone as a reagent for cobalt—S.K. Majumdar & A.K. De, Jadavpur University, Calcutta. *Z. anal. Chem.*, **177**, (1960), 97-100.

Liquid-liquid extraction of iron (III) with tributylphosphate—S.K. Majumdar & A.K. De, Jadavpur University, Calcutta. *Talanta*, **7** (1960), 1-6.

Dr. Amarjit Singh

Dr. Amarjit Singh has been appointed, on promotion, Deputy Director, CEERI, Pilani with effect from March 28, 1961.

Born at Ramdas (Amritsar Dt.) in 1924, Dr. Singh received his early education in Kapurthala. After graduation from Government College, Lahore and obtaining M.Sc. degree in physics from Panjab University, he left for U.S.A. (1945) for higher studies under a Government of India scholarship. During his studies abroad he got Master of Engineering Science degree and Ph. D. degree from the Harward University. On his return to India in 1949, he was appointed lecturer in Radio Physics at the University of Delhi. In 1953 he joined NPL, New Delhi and started investigations on microwave tubes. He was appointed Assistant Director, CEERI, in 1957, and later in April 1959 was made Assistant Director-in-Charge. At CEERI he has been guiding research and development work mainly on magnetrons, travelling wave tubes and power triodes.

Dr. Singh is the author of numerous research publications, and is a senior member of the Institute of Radio Engineers, New York.

PERSONAL

(*Contd. from p. 2, col. 3*)

●Dr. Bachitter Singh Bassi has joined CRRI, New Delhi, as Pool Officer with effect from March 20, 1961.

* * *

●Shri P.K. Gupte, Asst. Director, NML, Jamshedpur, left for a 4-month tour of Belgium on April 6, 1961 at the invitation of the Belgium Government. He will visit factories specialised in the production of ordinary and special steels.

●Shri R.D. Taneja, Senior Scientific Officer, Publications Directorate, CSIR, New Delhi, has been nominated a member of the Research and Publication Committee of the *Oil Technologists Association of India*, Kanpur, for 1961.

PATENTS & PROCESSES

Application Filed

75820 : *An improved profilograph (area meter) for the measurement of the cross-sectional area of mine-airways and for recording the shape of the same*—K.M. Kaiser, CMRS, Dhanbad.

Applications Accepted

67931 : *A new flavouring substance from waste black pepper and common salt*—T. Nanjappa, R. Rao, S.T. Dwarakanath & D.S. Johar, CFTRI, Mysore.

67932 : *Improvements in or relating to the process of separation and isolation of physiologically active principles of nim oil* (Melia indica).—C. Mitra, NCL, Poona.

69383 : *Refining of castor oil*—V.P. Harigopal, K.T. Achaya, S.A. Saletore & S.H. Zaheer, RRL, Hyderabad.

70172 : *An improved process for or relating to manufacture of lower vinyl esters in general and vinyl acetate in particular*—S. Ramanujam, R.K. Bhatnagar & N.R. Kuloor, Shri Ram Institute for Industrial Research, Delhi.

70889 : *A process for the production of graft-copolymers from natural rubber*—C.C. Menon & S.L. Kapur, NCL, Poona.

Applications Sealed

63890 : *A method for the conversion of higher tar acids to lower phenols*—N.C. Saha, N.G. Basak & A. Lahiri, CFRI, Jealgora.

66293 : *A process for the production of anthraquinone*—C.S.B. Nair, A. N. Basu & A. Lahiri, CFRI, Jealgora.

Rubber Base Contact Adhesive

The National Chemical Laboratory, Poona has developed a rubber-base contact adhesive (Indian Pat. No. 65977) which favourably compares in its performance with similar imported products.

The bond obtained from the adhesive is resistant to dilute acids and alkalies at ordinary temperatures but softens at about 90°C. In the case of metal bonds, shear strengths up to 1200 lb. per sq. in. have been obtained. The range of its usefulness can be increased by using it in combination with suitable rubbers, like Neoprene. Apart from its applications as general adhesive, the product can be used as an anchor coat in the manufacture of cellophane adhesive tapes.

Parties interested in undertaking the commercial development of the process may correspond with the Secretary, National Research Development Corporation, Mandi House, New Delhi.

Processes Leased Out

The following processes developed at the national laboratories have been leased out for commercial development :

1. Indelible ink, NPL, New Delhi—*Mysore Lac and Paint Works Ltd.*, Mysore.

2. Benzyl chloride, Regional Research Laboratory, Hyderabad (Indian Pat. No. 71864)—*White Star Pigment & Chemicals*; Bombay and *Daulatram Rameshwarlall*, Calcutta.

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CSIR NEWS

VOL. 11 NEW DELHI—MAY 8, 1961 : VAISAKH 18, 1883 No. 9

LTC Plant Inauguration

The Low Temperature Carbonization Plant of the CFRI, Jealgora, will be inaugurated by Pandit Binodanand Jha, Chief Minister of Bihar at 9.00 a m. on May 14, 1961. Dr. B.C. Roy, Chief Minister of West Bengal and Member, Governing Body, CSIR, will preside.

Symposium on Chemical Process Design

The CSIR Chemical Research Committee is sponsoring a symposium on Chemical Process Design at the Department of Chemical Technology and Chemical Engineering, Indian Institute of Science, Bangalore during July 24 & 25, 1961. The symposium will cover the following subjects:

(1) Chemical process development: Laboratory, bench and pilot plant scales

(2) Scaling up of chemical processes

(3) Chemical process equipment design

(4) Operating experiences of chemical production plants

Those who wish to contribute papers and participate in the symposium are requested to send their contributions and correspond with Prof. N.R. Kuloor, Indian Institute of Science, Bangalore-12.

Symposium on Low Temperature Carbonization of Coals

The Regional Research Laboratory, Hyderabad, is organising a symposium on 'Low-temperature Carbonization of Non-caking Coals and Briquetting of Coal Fines' during Nov. 20-22, 1961.

The principal object of the symposium is to focus attention on the rational utilization of low-grade coals to solve the problem of domestic fuel and to bring together the diverse interests connected with research, scientific, technical and social aspects of low-temperature carbonization of coal and briquetting of coal fines.

The symposium will cover the following aspects:

(1) Low-temperature carbonization

(2) Processing of by-products of low-temperature carbonization

(3) Briquetting of non-caking coal fines and lignites

(4) Economics, standards, statistics, etc.

Scientists in India and abroad engaged in the above fields are invited to participate in the symposium.

Intending contributors are requested to send abstracts of papers to the Director, Regional Research Laboratory, Hyderabad before **Aug. 15, 1961.** The last date for receipt of detailed papers is **Sept 15, 1961.**

Symposium on Food Needs and Resources

A symposium on 'Food Needs and Resources' sponsored by the National Institute of Sciences of India will be held at the Central Food Technological Research Institute, Mysore during May 16-18, 1961.

Prof. M.S. Thacker

Prof. M.S. Thacker, Secretary, Ministry of Scientific Research & Cultural Affairs and Director-General, Scientific & Industrial Research returned to New Delhi on April 26, 1961 after completion of his 4-week tour of Switzerland, U.K and U.S.A. (*CSIR News*, Vol. 11, No.6, p.1).

PERSONAL

●DR. K. S. VISWANATHAN has been appointed Senior Scientific Officer : Grade I, NAL, Bangalore with effect from March 20, 1961.

●DR. D. TIRUMALESA has been appointed Senior Scientific Officer : Grade I, NAL, Bangalore, with effect from March 21, 1961.

(*Contd. on p. 4, col. 1*)

Dr. B.C. Roy, Chief Minister, West Bengal and Member, Governing Body, CSIR, receiving the award of *Bharat Ratna* from Dr. Rajendra Prasad, President of India, at an investiture ceremony held at Rashtrapati Bhawan on April 27, 1961.

BRIEFS

Gnetum

This 142-page monograph (Authors: P. Maheshwari & Vimla Vasil, University of Delhi, Delhi) presents a comprehensive account of work done so far on *Gnetum*—an important genus among Gymnosperms. The publication includes a detailed description of its general distribution, morphology, anatomy, embryology and cytology. The relationship of *Gnetum* with *Ephedra* and *Welwitschia* genera and with rest of the Gymnosperms and Angiosperms has been described in the last chapter. The monograph includes a bibliography and contains 86 illustrations.

This publication is the first in the series of monographs initiated by the Botanical Monographs Comimittee of the CSIR in 1958 with the object of stimulating further research and providing source material for preparation of text books of Indian botany, which at present suffer from lack of emphasis on Indian work.

Copies of the publication (Price, Rs. 20) are available from the Under Secretary, Publications Directorate, CSIR, New Delhi.

CSIR Annual Reports

The Technical Report (1959-60) and Annual Report (1960-61) of the CSIR, as approved by the Governing Body, CSIR at their meeting held on March 25, 1961 have been published.

The reports were placed on the table of Rajya Sabha and Lok Sabha on April 27 and May 1, 1961 respectively.

Symposium on Vision

A three-day symposium on Vision organized by the National Physical Laboratory, New Delhi, on the occasion of the visit of Prof. Y. LeGrand, Secretary, International Commission of Illumination, Paris, and Professor in the Museum d' Histoire Naturelle (Paris), ended on April 26, 1961. Prof. LeGrand was accompanied by Prof. Dubois-Poulsen, Director, National Ophthalmological Quinze-Vingt Hospital, Paris and President, French Ophthalmological Society.

Prof. Y. LeGrand

Representatives from the following organizations participated in the symposium: Armed Forces Medical Directorate (Army, Navy and Air Force), Directorate General of Health Services, World Health Organization (W. H. O.), Indian Council of Medical Research, All India Ophthalmological Society and its Delhi Branch, All India Institute of Medical Sciences, and Institute of Audio Visual Education.

Prof. LeGrand delivered the opening lecture on 'Colour vision in man and animals' followed by lectures on 'Evolution of the eye' and 'Vision in military aviation'. In the afternoon session, Prof. Dubois-Poulsen spoke on 'Anomalies in colour vision' followed by a lecture on 'Colour blindness' by Dr. W. M. Vaidya, Head of the Division of Optics, NPL.

The morning session on April 25 started by an address by Prof. LeGrand on 'Visual problems in illumination' followed by a discussion on the 'Importance of lighting in the prevention of accidents' opened by Dr. Radavanovic of the W.H.O. In the afternoon Prof. Doubois-Poulsen spoke on 'Visual fatigue'.

On April 26, Prof. Dubois-Poulsen gave a talk on 'Grafting of the cornea.' The optical properties of the human cornea were discussed in a lecture by Prof. LeGrand. Among other subjects on which lectures were delivered by various speakers are: (i) Injurious effects of radiation; (ii) Eye strain in cinemas; (iii) Danger of looking at the sun during the eclipse; (iv) Electroretinography; and (v) Vision problems in similar twins.

NAL, Bangalore

The National Aeronautical Laboratory, Bangalore was host to the members of the Aeronautical Society of India at its 13th Annual General meeting held on March 25 & 26, 1961.

Dr. P. Nilakantan, Director, NAL, delivered a lecture on 'The Pattern of Aeronautical Research for India' at the inaugural session.

* * *

The research scheme, *Protection of timber against marine organism* (Forest Research Institute, Dehra Dun), sponsored by the CSIR up till Feb. 28, 1961 has been taken over by the Ministry of Food and Agriculture.

Dr. K. Venkataraman, Director, NCL, Poona receiving the award of *Padma Bhushan* from Dr. Rajendra Prasad, President of India

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Manufacture of Aluminium Bronze—Super-duty aluminium bronze suitable for manufacturing cast fittings for 25 kV. traction overhead equipment in Indian Railways Electrification Project (REP) has been produced at the instance of the Research Designs and Standards Organisation, Ministry of Railways, Chittaranjan.

Detailed experimental work was carried out at the Laboratory to determine the compositional limits of copper, aluminium, iron and to establish melting and casting practices to achieve the mechanical properties as required by the REP specification.

CFRI, JEALGORA

Coal Pyrolysis—Studies have been carried out to explain the mechanism of coke formation and also to elucidate the plastic and coking behaviour of oxidized coals from the knowledge of Oil and Gas Points in the low-temperature carbonization (Gray-King) assay of coals.

The study has shown that the oil and gas points may be considered as the depolymerization and decomposition points respectively in the pyrolysis of straight caking coals. The alicyclic part of coal present in the side-chains remains mostly hindered in the lower rank non-caking coals resulting in its delay in splitting off. Hence, the oil and gas points of non-caking coals are influenced by different conditions compared to the caking coals. The characteristic temperatures of oil and gas points are independent of the mineral matter contents of coals and thus might serve as better index of their inherent coking properties. The difference in the gas and oil points of coals is useful in the prediction of composition of binary blends to yield the best cokes.

The quality of plastic material of caking coals on oxidation may remain unaffected whereas the quantity may differ—B. N. Bose, R. Chaterjee, N. N. Das Gupta & A. Lahiri.

IIBEM, CALCUTTA

Non-agglutinating and Agglutinating Vibrios—An analysis by gel diffusion and intragel absorption tests of 4 Ogwa and 26 NAG strains isolated from cholera cases and environmental sources was undertaken to study the relationship between the two vibrio species.

At the intra-species level the specific antigenic fractions of NAG vibrios differed in different strains in a manner similar to those observed in cases of Ogawa and Inaba serotypes of *Vibrio cholerae*. NAG vibrios possess several heat-labile flagellar and somatic antigens in common with *V. cholerae*. All the NAG vibrios contained one heat-stable somatic antigen identical with that of cholera vibrios. In addition, some of the NAG vibrios shared several heat-denatured or unmasked antigens of cholera vibrios. A number of NAG strains showed closer antigenic relationship with *V. cholerae*, than with others.

These observations reveal close antigenic relationship between the agglutinable and non-agglutinable vibrios—S.N. Ghosh & S. Mukerjee.

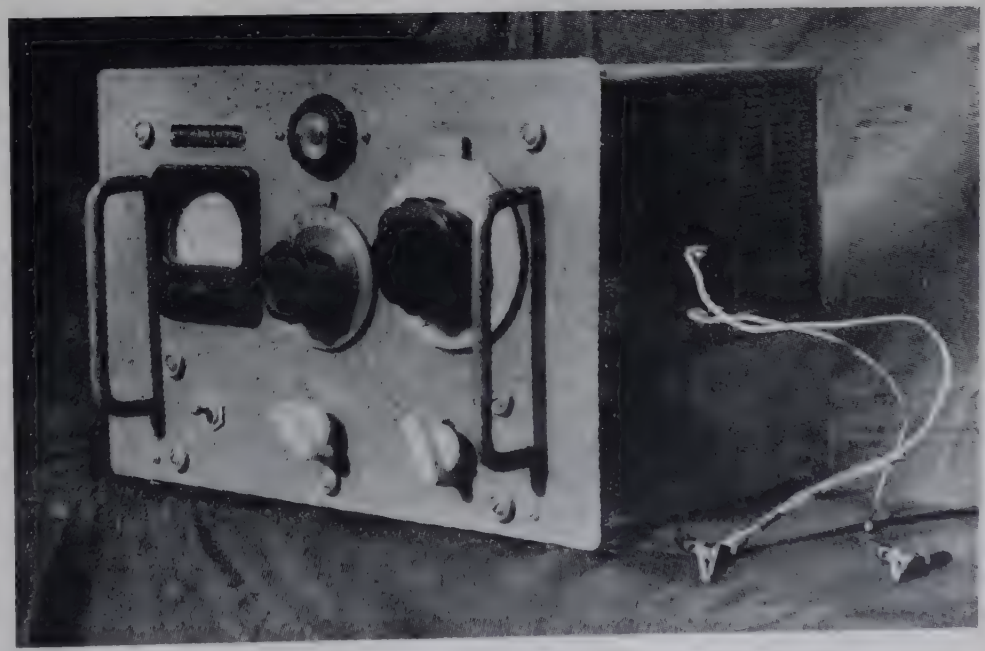
Sponsored Research

High Frequency Titration—Studies have been carried out on the estimation of inorganic and organic substances by high frequency titration method. An apparatus in which changes in capacity varies linearly with the composition of solution during titration has been designed and constructed. Using this apparatus a modified type of Hall's apparatus was constructed and successfully used for the titration of monobasic and dibasic acids. Precipitation titrations were also successfully tried for the estimation of Ag, Pb, Mg, Ba, Ca and Sr ions as well as SO_4 and Cl ions. Estimation of mixtures containing Ca and Ba, and Ca and Mg ions was carried out and a high frequency method of estimation of hardness of water has been worked out.

Estimation of organic substances like benzyl mercaptans and thioglycolic acid was attempted by titration with an iodine solution and results found to be comparable to the conventional amperometric method. The apparatus has been found suitable only for micro-estimation in dilute solutions (M/500 or lower) but failed when tried with ordinary concentrations (M/10)—S. N. Mukherjee, A. S. Bhattacharjee & (Miss) B. Ray, Jadavpur University, Calcutta.

* * *

The CSIR enquiry, *Ozone observations at Varanasi* by Dr. Raj Nath, Head of the Geophysics Department, Banaras Hindu University, Varanasi, has been terminated with effect from March 31, 1961.



High frequency titration apparatus designed and constructed at Jadavpur University, Calcutta

PERSONAL

(*Contd. from p. 1, col. 3*)

●SHRI C. S. RANGAN has been appointed Senior Scientific Officer : Grade I, NAL, Bangalore, with effect from April 10, 1961.

●DR. N. U. RAO has been appointed Senior Scientific Officer : Grade I, CPHERI, Nagpur, with effect from March 30, 1961.

●SHRI G. SRI RAM has been appointed Senior Scientific Officer : Grade II, NAL, Bangalore, with effect from March 27, 1961.

●SHRI S. RAJAGOPALAN has been appointed Senior Scientific Officer : Grade II, CPHERI, Nagpur. He has reported for duty at the Delhi Field Centre of the Institute with effect from April 15, 1961.

●DR. (MRS) ANJALI SAXENA joined CDRI, Lucknow, as Pool Officer, with effect from April 1, 1961.

* * *

●DR. K. L. ARORA, Junior Scientific Officer, CDRI, Lucknow, proceeded on April 10, 1961 for training in 'Fermentation with special reference to production of vitamins and drugs' in Czechoslovakia, Hungary and U. S. S. R., under a six-month UNTAA fellowship.

●SHRI S. RANGA RAJA RAO, Asst. Editor, Publications Directorate, CSIR, New Delhi joined duty with effect from April 29, 1961 after completion of his training in Scientific Information Services in U.K. (under the Colombo Plan) and in the Continent.

* * *

●The following have been nominated members of the Committee constituted by the Ministry of Commerce & Industry to examine the detailed project reports on the Drugs Projects (including surgical instruments) to be established in India with the assistance of USSR : DR. K. N. MATHUR, Director, CSIO, New Delhi ; DR. K. VENKATARAMAN, Director, NCL, Poona ; DR. B. MUKERJI, Director, CDRI, Lucknow ; and SHRI P. M. NABAR, Officer-in-Charge, CIMPO, New Delhi.

* * *

●SHRI A. K. BANERJEE, Junior Scientific Officer, CFRI, Jealgora, has been awarded D. Phil. degree in Science by the University of Allahabad for his thesis, *Studies in Alkali Soils.*

PATENTS & PROCESSES

Application Filed

74355 : *Obtaining light-coloured oil and soapstock in refining cotton-seed oil*—RRL, Hyderabad.

Application Accepted

69165 : *A method of making binding material from blast furnace slag*—L. C. Jain and N. K. Patwardhan, CBRI, Roorkee.

Applications Sealed

INDIA

65778 : *Improvements in or relating to the production of* trans-*diethyl-stilbestrol dimethyl ether and allied stilbenes*—C. C. Joshi, J.L. Bose and R.C. Shah, NCL, Poona.

65976 : *Improvements in or relating to suspension polymerization of vinyl monomers*—R. M. Joshi and S. L. Kapur, NCL, Poona.

66148 : *Improvements in or relating to lead dioxide semiconductors in the preparation of rectifiers*—K.V. Udupa, CECRI, Karaikudi.

66670 : *A device for the rapid classification of mica, or the like high frequency dielectrics on the basis of power factor*—S. S. Mandal and S.B. Roy, CGCRI, Calcutta.

66803 : *Improvements in or relating to the manufacture of pressure sensitive adhesive tapes*—S. L. Kapur and B.R. Rao, NCL, Poona.

67468 : *Improvements in or relating to the preparation and isolation of isonicotinic and nicotinic acids from the* deta-*picoline cut*—A. Lahiri, M. S. Rao, A. P. R. Panicker and G. N. Kulsrestha, CFRI, Jealgora.

67821 : *A process for the production of fungicides from coal tar*—J. G. Saha, A. N. Basu and A. Lahiri, CFRI, Jealgora.

69690 : *Improvements in or relating to paints*—Atma Ram, S. B. Roy and H. D. Sircar, CGCRI, Calcutta.

69697 : *Improvements in or relating to spin pasteurizers for canned acid foods*—J. S. Pruthi, P. K. Ramanathan and Girdhari Lal CFTRI, Mysore.

U. K.

852721 (corresponding to Indian Pat. Nos. 61484, 61773 and 62262) : *Improvements in or relating to the refining and the utilization of cotton seed products*—T. R. Seshadri and K. Chander, University of Delhi, Delhi.

Processes Leased Out

The following processes developed at the CFRI, Jealgora have been leased out for exploitation :

1. Chain Grate Stokers : Moving bed devolatilisation process for coal (Indian Pat. No. 61020)—*Coke Oven Construction Co. (P) Ltd.*, Calcutta.

2. Resins from tar oil fractions (Indian Pat. No. 56581)—*Administrator, Durgapur Project*, Calcutta.

SASMIRA, Bombay

The offices of the *Silk & Art Silk Mills' Research Association* have been shifted from Resham Bhavan to Dr. Annie Besant Road, Worli, Bombay-18.

Printed at Asia Press, Delhi-6 and Published by the Council of Scientific & Industrial Research, Rafi Marg, New Delhi-1.

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CSIR NEWS

VOL. II NEW DELHI—MAY 22, 1961 : JAISTHA 1, 1883 No. 10

M E E T I N G

A meeting of the Standing Committee for Retiring Research Scientists will be held in Room No. 153, North Block, Central Secretariat, New Delhi on May 29, 1961 at 9.30 a.m. Prof. Humayun Kabir, Minister for Scientific Research and Cultural Affairs and Vice-President, CSIR, will preside.

CSIR Takes Over Central Board of Geophysics

In pursuance of the decision of the Governing Body of the CSIR made at their meeting held on March 25, 1961, the Central Board of Geophysics including its two research wings: (1) Oceanographic Research Wing at Naval Physical Laboratory, Cochin and (2) Geophysical Research Wing, Calcutta have been taken over with effect from April 1, 1961. The office of the Board is at present located at 5, Middleton Street, Calcutta-16.

Building Research Workers Conference

A conference of building research workers will be held at the Central Building Research Institute, Roorkee during Nov. 13-14, 1961. The problems connected with the following aspects of functional efficiency of building design and construction will be discussed :

(1) Effect of climate on building design in the tropics

(2) Thermal comfort in buildings : Ventilation, air-conditioning, performance of building components

(3) Acoustics of buildings

(4) Lighting in buildings

(5) Testing and standardization of thermal and acoustical materials

Those desirous of participating in the conference may send abstracts of their papers to the Director, CBRI, Roorkee by July 15, 1961. Full papers should reach by Aug. 15, 1961.

Training in Microwaves

The Council of Scientific & Industrial Research in collaboration with the Ministry of Defence has arranged a short-term (one month) practical training course in Microwaves for the benefit of persons in universities, research institutions and government departments engaged in research and development work in the field of microwaves. The course will commence on June 1, 1961.

The training course, as in previous years, will be conducted at No. 509-Army Base Workshops, E.M.E., Agra.

P E R S O N A L

● SHRI S. BAGCHI, Deputy Director, CMRS, Dhanbad has been appointed to officiate as Deputy Director-in-charge, Indian Institute of Petroleum, Dehra Dun with effect from April 10, 1961 during the absence abroad (on leave for about two and a half months) of Dr. J W. Whitaker.

● DR. K. Y. SHRIKHANDE has been appointed, on promotion, Senior Scientific Officer : Grade I, CFRI, Jealgora, with effect from May 1, 1961.

● SHRI D. N. LAHIRI has been appointed, on promotion, Senior Scientific Officer : Grade II, CFRI, Jealgora, with effect from April 29, 1961.

● SHRI M. M. SEN has been appointed, on promotion, Senior Scientific Officer : Grade II, CFRI, Jealgora, with effect from May 1, 1961.

● SHRI M. P. KUMARASWAMY, Senior Scientific Assistant, NPL, New Delhi, has been appointed Senior Scientific Officer : Grade II, CMERI, Durgapur, with effect from April 6, 1961.

● SHRI SUDARSHAN KUMAR has been appointed, Senior Scientific Officer : Grade II, CMERI, Durgapur, with effect from April 24, 1961.

● SHRI BASUDAM BANERJEE has been appointed, on promotion, Geologist, CFRI, Jealgora, with effect from April 29, 1961.

● SHRI K. K. MITRA has been appointed Purchase Officer, CGCRI, Calcutta, with effect from May 10, 1961.

● DR. H.A.B. PARPIA, Industrial Liaison & Extension Officer, CSIR, New Delhi, consequent on his resigning has been sanctioned 58-days terminal leave with effect from April 30, 1961.

* * *

● DR. B. MUKERJI, Director, CDRI, Lucknow, has been nominated a member of the WHO Expert Advisory Panel on International Pharmacopoeia and Pharmaceutical Preparations, up to June 30, 1962.

● DR. V. SUBRAHMANYAN, Director, CFTRI, Mysore, has been elected (i) Vice-chairman of the Agricultural and Food Products Division Council for three years; and (ii) Vice-chairman, Standing Working Committee of the Division Council, and alternate member of the General Council, Executive Committee and Finance Committee of the Indian Standards Institution.

● LT. GEN. H. WILLIAMS, Director, CBRI, Roorkee, has been nominated a member of the Reviewing Committee for Survey of India and National Atlas Organization, constituted by the Ministry of Scientific Research and Cultural Affairs.

● DR. A. LAHIRI, Director, and SHRI G. G. SARKAR, Senior Scientific Officer, CFRI, Jealgora, have been nominated members of the Technical Committee for Coal Washery to be set up at Durgapur.

● DR. S. HUSAIN ZAHEER, Director, RRL, Hyderabad, has been nominated Chairman, Coal Carbonization Sectional Committee, Indian Standards Institution.

● DR. P. NILAKANTAN, Director, NAL, Bangalore, has been nominated a CSIR representative on the Court of the Indian Institute of Science, Bangalore for 1961-64.

(Contd. on p. 2, col. 3)

BRIEFS

L.T.C. and Coal Washing Plants Inaugurated

The prototype low-temperature carbonization pilot plant of the CFRI, Jealgora was formally inaugurated by Pandit Binodanand Jha, Chief Minister of Bihar, on May 14, 1961. Dr. B.C. Roy, Chief Minister of West Bengal, Shri S.S. Khera, Secretary, Ministry of Steel, Mines & Fuel and Prof. M.S. Thacker, Director-General, Scientific & Industrial Research were amongst the distinguished persons who were present at the function.

The semi-commercial plant (*CSIR NEWS*, Vol. 10, No. 22, p.1) has been set up for studies on the carbonization of non-coking and weakly caking coals and briquetted coal fines.

On the same day, Prof. M.S. Thacker inaugurated the 40-ton per hour (t.p.h.) pilot coal washing plant of the Institute (*CSIR NEWS*, Vol. 10, No.11. p. 3). An important feature of the plant is that it incorporates adequate flexibility for following at least six to eight different types of washing schemes.

Shri S.S. Khera declared open the newly built pilot plant building accommodating some of the semi-pilot and pilot plants at the Institute.

Harvest from the Wind

The scope and potentialities of utilization of wind resources of India for the development of power in rural areas through windmills and the work carried out by the CSIR Wind Power Committee towards this end has been outlined in a recent brochure, *Harvest from the Wind.*

The 8-page popular illustrated brochure gives information on the wind characteristics of various regions and wind-maps of India, considerations in the selection of windmills and site of installation, and maintenance. Besides, it includes a brief account of the two types (4-bladed WP-1 and the 12-bladed WP-2) of windmills designed and satisfactorily operated for lifting water for irrigation purposes.

Catalogue of CSIR Publications

An illustrated, descriptive and classified catalogue of the publications (available for sale with the Publications Directorate, CSIR) has been recently published. Copies of the catalogue may be had from the Under Secretary, Publications Directorate, CSIR, New Delhi-1.

New Additions To BITM

An electrified model of the Pan American World Airways DC-7 Clipper was presented to the BITM, Calcutta on April 28, 1961 by Mr. Russel Robinson, District Traffic Manager, Calcutta.

A ½ h.p. d.c. motor (manufactured in 1888 by M/s. Crompton Parkinson of Chelmsford, England) was also presented the same afternoon by Mr. A.M. Steele, Branch Manager, M/s. Greaves Cotton & Crompton Parkinson, Calcutta. The inventor, Colonel Crompton, was in India in 1864 and the invention of the first mechanically propelled vehicle on Indian roads has been accredited to him.

Research Fellowships

The following have been awarded *CSIR Fellowships* for research in schemes noted against their names:

Senior Fellowships:

1. SHRI B.N. DIXIT—*Pharmacological research unit* (Medical College, Baroda).

2. SHRI GOVINDA SARMA—*Chemical investigations of Indian lichens and heart-woods* (University of Delhi, Delhi).

Junior Fellowships:

1. SHRI BRAJ KISHORE—*Thermodynamic method of measuring turbine efficiency* (Bihar College of Engineering, Patna).

2. SHRI SUBHAS CHANDRA BOSE—*Theory of strong electrolytes* (University College of Science, Calcutta).

3. SHRI V.R. FANSE—*Economic design of large span roof* (Roorkee University, Rookee).

* * *

The research scheme, *Studies in synthetic perfumes* (Investigator-in charge: Dr. K.S. Narang, Panjab University, Chandigarh) has been terminated from April 30, 1961.

* * *

The CSIR *Essential Oils Research Centre* (*Chemical and Cultural*) at the H.B. Technological Institute, Kanpur has been closed from Feb. 28, 1961.

PERSONAL

(*Contd. from p. 1, col. 3*)

● DR. P. NILAKANTAN, Director, NAL, Bangalore, has been elected President of the *Aeronautical Society of India*, for 1961.

● SHRI S. BAGCHI, Deputy Director and DR. G.N. BADAMI, Asst. Director, CMRS, Dhanbad, have been nominated Principal Member and Alternate Member respectively of the Industrial Safety Advisory Committee of the Indian Standards Institution.

● SHRI H.C. BHATNAGAR, Officer-on-Special Duty, CFTRI, Mysore, has been nominated as a Co-opted Member of the Export Promotion Committee of the Development Council for Food Processing Industries.

● DR. S. K. BARAT, Asst. Director, CLRI, Madras, has been nominated an alternate member to the Director, CLRI, on the Veterinary, Parasitology and Zoology Committee of the Indian Council of Agricultural Research *vice* Dr. S. N. Sen, Senior Scientific Officer, CLRI.

● DR. G.M. VYAS, Senior Scientific Officer, NCL, Poona, has been nominated a member of the Technological Research Sub-Committee constituted by the Indian Central Cotton Committee.

* * *

● DR. K. S. CHARI, Asst. Director, RRL, Hyderabad, has been elected an Associate Member of the *Institute of Chemical Engineers* (London).

● SHRI M. M. SEN, Senior Scientific Officer, CFRI, Jealgora, has been elected Associate Member of the *Indian Institute of Chemical Engineers.* He has also been enrolled Associate Member of the *Institution of Engineers* (*India*).

● SHRI A.G. SAHA, Senior Scientific Asst., CFRI, Jealgora, has been elected Associate Member of the *Indian Institute of Chemical Engineers.*

● SHRI SURESH CHANDRA SRIVASTAVA, Senior Research Fellow, CSIR scheme, Studies in inorganic complexes (Investigator-in-charge, Dr. Arun K. Dey, University of Allahabad) has been awarded the D.Phil. degree by the University of Allahabad for his thesis: *Studies in Some Organic Chelating Agents.*

RESEARCH IN PROGRESS

National Laboratories

CFRI, JEALGORA

Domestic Coke from Non-Coking Coals—Preparation of domestic coke from weakly or non-coking slack coals has been investigated. Mixed slack coals (minus 1 in.) from Sunkerpore (Raniganj), Jaipuria-Kajora (Raniganj) and Bhurkunda (Argada) areas were briquetted in a low pressure pilot briquetting plant and subsequently carbonized (low temperature carbonization) in an electrically heated Swoboda oven. The biquettes were further subjected to carbonization in a 400-lb. electrically heated oven to the desired temperature and maintained until gas evolution ceased or it was less than 10 cu. ft/hr. The charge on cooling was tested for its strength. A slight decrease in the strength of briquettes is observed on carbonization. Briquettes of optimum strength are obtained on carbonization at 675°C.

The study has shown that, in general, there is an improvement in the strength of the carbonized briquettes with the increase in binder content; 9-11 per cent medium pitch binder gives the optimum mechanical strength. The carbonized briquettes burn excellently without emission of smoke in a domestic *chulla* and may be suitable as a domestic fuel—T.V. SUBRAMANIAM, T.A. SUBRAMANIAM, B.C. JANA & M.S. IYENGAR.

CECRI, KARAIKUDI

Pole Detection Meter for Dry Batteries—An instrument for the detection of polarity of dry storage batteries has been designed and fabricated employing an electrometer circuit with a Philips' 4067 tube. The output of the electrometer circuit is suitably amplified to drive a d.c. microammeter. The direction of deflection in the microammeter shows the correctness of pole markings. The instrument registers a null deflection if the formed plates within the battery are short circuited—U.H. NARAYANAN & M.S. KASABEKAR.

RRL, HYDERABAD

Kitchenware Enamels—Enamel compositions using titanium dioxide as opacifying agent developed at the Laboratory (*CSIR NEWS*, Vol. 10, No. 14, p. 3) have been tested for their performance under factory conditions in collaboration with a local industrial concern. The test results have shown that 0.15 mm. thick titanium dioxide based enamel coat is as good as 0.275 mm. coat of tin oxide opacifying enamels.

Tin oxide is imported from abroad and costs six-times more than titanium dioxide.

Illuminating Fuels from L.T. Tar—A process has been developed and patented for the preparation of illuminating fuels from low-temperature tar fractions produced at a pilot-plant at the Laboratory. The product has good illuminating properties and can serve as a substitute for kerosene.

The process is based on the separation of illuminating fuels from tar by solvent extraction followed by catalytic hydrogenation.

CMRS, DHANBAD

Mine Illumination—Survey of illumination in mines has been in progress to assess the levels of illumination provided and those necessary for various purposes.

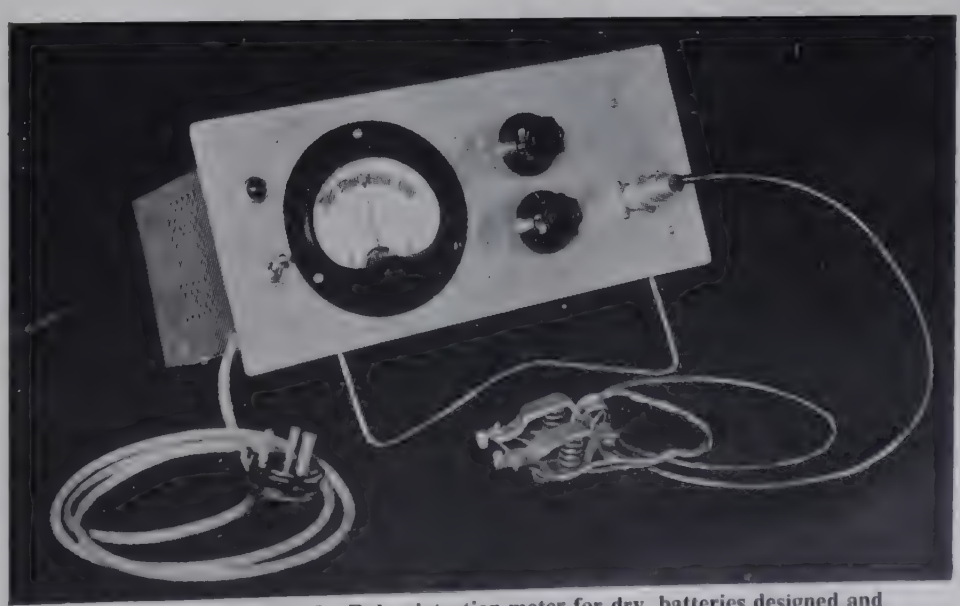
In one of the surveys it is found that the average illumination at the pit bottom of a mine in India is of the order of 0.30 to 0.40 ft candles with diversity factor of about 15 and that along the mine roadways, 0.05 to 0.10 ft candles with diversity factor as high as 200. The data may be helpful in assessing the desirable levels of illumination for various underground tasks.

Mine Tub Coupling Link—Testing of mild steel coupling link, which is used to connect mine tubs for hauling, has shown that the link will have over 50 per cent increased static strength (6 tons) when its two close ends are fabricated in one plane and not in helical form.

Sponsored Research

Acid Metabolism in Plants—The biochemical mechanism involved in large accumulation of dextro-tartrate in tamarind leaves and fruits has been investigated.

Enzymes responsible for the metabolic conversions of various racemic forms of tartaric acids have been isolated and their properties studied. Tartaric dehydrogenase obtained from leaves is specifically active towards laevo-tartaric acid while it is inactive towards dextro- and meso-tartaric acids. Fractionation of enzymic protein from fruits by ammonium sulphate does not show any dehydrogenase activity but an active enzyme which readily converts the meso-tartaric acid to dextro-tartaric acid is obtained. The enzyme, named *Tartaric racemase* is also active in the leaves and this might account for the inactivity of dehydrogenase towards meso-tartaric acid which has been reported to be active in vine and wheat embryo preparations.



CECRI, KARAIKUDI—Pole detection meter for dry batteries designed and fabricated at the Institute

The study shows that the presence of an active *Tartaric racemase* which converts meso-tartrate to dextro-tartrate and the inability of the tartaric dehyrogenase to attack the dextro-form, results into the large accumulation of dextro-tartrate in tamarind leaves and fruits—SHRI RANJAN, K.K. PATNAIK & M.M. LALORAYA, Allahabad University, Allahabad.

Sediment Machanics—Studies on the mechanics of sediment transportation and scour have been carried out with the object of replacing the existing empirical rules of design in hydraulic works by rational procedures.

The effect of geometry of the blocks on stability, the principle for the determination of the optimum length for the pitching and need for using filter backing for talus have been investigated for understanding the stability of loose stone aprons. The stability of the loose stone pitching, whether of cubes or of irregular stones, has been found to be a function of the Froude number. There seems to be no special advantage of adopting geometrical forms such as cubes for the loose stone. But the size of stone to be used for ensuring stability depends upon the mean velocity of flow.

The optimum length for the pitching is up to the point of deepest scour obtained for the condition when no pitching is used. Uneven subsidence of pitching as distinguished from launching can be controlled by using a layer of quarry rubbish below the pitching to act as an inverted filter.

The flood scour at barrages, both downstream and upstream, have been studied. The use of light-weight materials such as coal for the bed, tilting of the bed, and injection of the sediment as in river models have helped to simulate the hydraulic features more satisfactorily than in the conventional models run on the basis of Froude's law.

The head losses in silt ejector tunnels were found to be greater for sediment laden water than for clear water, the discharge remaining same.

The effect of beds in the ejector tunnels affects the head losses not only in the bend but also in the straight reach in continuation. Hence, the conventional method of computation of head losses using Manning's equation has not been found applicable.

A study of the problem of the design of stable channels in erodible materials has shown that the stability of channel can be correlated with the Froude number and that the maximum value for stability should not exceed 0.3. Some of the recent equations furnished by Lacey on analytical basis have been verified experimentally. The results regarding the relationship between discharge hydraulic mean radius and area of cross section for coarse non-cohesive material have been found to be in agreement with field data obtained by Simons and Albertson— J. VISWESWARA RAO & V. VASUDEVA MURTHY, Civil Engineering Department, Indian Institute of Technology, Kharagpur (1958-1961).

Research Papers

Corrosion of copper and its alloys in sea bittern—A. N. Kappanna & A. Visheswara Rao, CSRI, Bhavnagar. *Indian J. appl. Chem.*, **23** (1960), 117-21.

A resume of lime stabilization with particular reference to the effects of lime on the physics and chemistry of soils—H. L. Uppal & R. M. Palit, CRRI, New Delhi. *J. Indian Roads Congr.*, **25** (1960), 203-212.

A study of soft aggregates from different parts of India with a view to their use in road construction: Part III—Bombay (The present Maharashtra & Gujerat)—H. L. Uppal & Bhupinder Singh, CRRI, New Delhi. *J. Indian Roads Congr.*, **25** (1960), 357-395.

On the production of ferro-coke—N.N. Das Gupta, S. K. Sharma, B. N. Sharma & S. Banerjee, CFRI, Jealgora. *J. Mines Metals Fuels*, **9** (3) (1961), 7-10.

Liquid-liquid extraction of vanadium (V) with tributylphosphate—S. K. Majumdar & A. K. De, Jadavpur University, Calcutta. *Analyt. Chem.*, **33** (1961), 297-98

Cation exchange studies of lead (II) on Dowex 50W X8: Separation from mixtures—S. M. Khopkar & A. K. De, Jadavpur University, Calcutta. *Talanta*, 7 (1960), 7-11.

Anion exchange studies of zirconium in citrate solution: Separation from mixtures—S. M. Khopkar & A. K. De, Jadavpur University, Calcutta. *Analyt. chim. acta*, **24** (1961), 134-37.

In Parliament

Fungicidal Wax Emulsion—Prof. Humayun Kabir, Minister for Scientific Research & Cultural Affairs in reply to a question by Shri Nawab Singh Chauhan affirmed in the Rajya Sabha that the Central Food Technological Research Institute, Mysore has evolved a wax emulsion which can be applied to extend the storage life of fresh fruits and vegetables and to reduce spoilage during transportation. The cost of waxing of fruits (including labour charges) on a pilot plant scale has been estimated as follows: 13 nP. per 100 apples, oranges, mangoes, etc., and 5-6 nP. per bunch of bananas containing 100-120 fingers.

The Minister further informed that bananas treated with the emulsion have been exported to West Asian countries by a private firm (*May 3, 1961*).

Commercial Utilization of CSIR Processes—Prof. Humayun Kabir stated in the Rajya Sabha that the following steps have been undertaken by the CSIR to ensure that new processes and inventions developed by national laboratories are more effectively used for industrial advancement: (1) Maintenance of active and live contact between national laboratories and the industry through industrial liaison officers, (2) preparation of special literature giving complete information of new inventions, (3) establishment of extension services to demonstrate to the industry new inventions and processes, (4) holding of conferences and symposia on subjects of special interest to industry and (5) nomination of industrialists on the executive councils of the national laboratories and other technical committees.

The Minister, who was replying to a question by Shri Satyacharan, stated that as many as 76 processes developed under the auspices of the CSIR have been leased out for commercial exploitation and 27 are in commercial production (*May 3, 1961*).

Printed at Asia Press, Delhi-6 and Published by the Council of Scientific & Industrial Research, Rafi Marg, New Delhi-1.

R. N. 4212/5

CSIR NEWS

VOL. II NEW DELHI—JUNE 12, 1961 : JAISTHA 22, 1883 No. 11

MEETING

A meeting of the Electrical and Mechanical Engineering Research Committee will be held at the Indian Institute of Science, Bangalore on June 28, 1961 at 2.30 p.m. Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, will preside.

Symposium on Chemical Process Design

The CSIR Chemical Research Committee is sponsoring a symposium on *Chemical Process Design* at the Indian Institute of Science, Bangalore during July 24 & 25, 1961. The symposium will cover the following aspects :

(1) Chemical process development : Laboratory, bench and pilot plant scales

(2) Scaling up of chemical processes

(3) Chemical process equipment design

(4) Operating experiences of chemical production plants

Those who wish to contribute papers or otherwise participate in the symposium are requested to correspond with Prof. N.R. Kuloor, Department of Chemical Technology and Chemical Engineering, Indian Institute of Science, Bangalore.

PERSONAL

● SHRI B.N. SASTRI, Chief Editor, Publications Directorate, CSIR, New Delhi has proceeded on 2 months' leave with effect from June 1, 1961. SHRI K. VENKATARAMAN Under Secretary, Publications Directorate is looking after the duties of the Chief Editor.

● SHRI K.S. NAGARAJAN, Photographic Officer, Insdoc, NPL, New Delhi has been appointed Senior Technical Officer : Grade I, NAL, Bangalore, with effect from May 1, 1961.

● SHRI M.K. SENGUPTA, Junior Scientific Officer, NPL, New Delhi has been appointed Senior Technical Officer: Grade I, NAL, Bangalore, with effect from May 11, 1961.

● SHRI P.L. DE has been appointed Senior Scientific Officer : Grade I, CBRI, Roorkee, with effect from May 15, 1961.

● SHRI K. SIVA PRASAD has been appointed Senior Scientific Officer : Grade II, CBRI, Roorkee, with effect from April 20, 1961.

● DR. N.R. SUBRAMANIAN, Junior Scientific Officer, NPL, New Delhi has been appointed Senior Scientific Officer : Grade II, NAL, Bangalore, with effect from April 24, 1961.

● SHRI S.C. VASHISHTH has been appointed Senior Technical Officer: Grade II, NAL, Bangalore, with effect from May 1, 1961.

● DR. C. R. GUHA has been appointed Asst. Surgeon : Grade I, NML, Jamshedpur, with effect from April 10, 1961.

● SARVASHRI G.N. KULASHRESTHA, A.C. BHATTACHARYA & DILIP KUMAR MUKHERJEE have been appointed, on promotion, Junior Scientific Officers, CFRI, Jealgora, with effect from May 13, 1961.

● SHRI A.K. BASU has been appointed, on promotion, Junior Scientific Officer, CFRI, Jealgora, with effect from May 14, 1961.

● SHRI PRITHVI PAL SINGH KAPUR has been appointed Stores Verification Officer, CSIR Secretariat, New Delhi, with effect from May 24, 1961.

● DR. A.P. SINGH has joined NCL, Poona, as Pool Officer with effect from May 1, 1961.

● SHRI J. VITHAYHTHIL PAUL has joined NCL, Poona, as Pool Officer, with effect from May 8, 1961.

● DR. AJIT KUMAR GHOSH has joined NCL, Poona, as Pool Officer, with effect from May 11, 1961.

* * *

● DR. A. SREENIVASAN, Deputy Director, CFTRI, Mysore, left for New York on June 3, 1961 for attending the meeting (June 5-10, 1961) of the FAO/WHO/Unicef Protein Advisory Group. He is expected to return to Mysore on June 13, 1961.

Prof. M.S. Thacker

Prof. M.S. Thacker, Director-General, Scientific & Industrial Research has been invited to become a member of the *International Advisory Committee on Research* in the Natural Sciences Programme of Unesco. Prof. Thacker has accepted the invitation.

● Dr. M. SWAMINATHAN, Asst. Director and Head of the Division of Dietetics, CFTRI, Mysore, who had been to Rome for attending the meeting of FAO/WHO Joint Expert Committee on Calcium Requirements, returned and joined duty with effect from June 3, 1961.

* * *

● DR. B. MUKERJI, Director, CDRI, Lucknow, has been renominated Chairman of the Scientific Research Committee, Uttar Pradesh Government.

● DR. J. W. WHITAKER, Director, IIP, Dehra Dun, has been nominated a member of the Governing Council of the Indian School of Mines and Applied Geology, Dhanbad.

● DR. K. VENKATARAMAN, Director, and DR. J. GUPTA, Asst. Director, NCL, Poona, have been nominated Principal Member and Alternate Member respectively of the Advisory Board of the Institute of Armament Studies, Ministry of Defence.

● DR. A. LAHIRI, Director, CFRI, Jealgora, has been nominated a Director of the Durgapur Industries Ltd., Durgapur Industries Board.

● DR. A. SREENIVASAN, Deputy Director, CFTRI, Mysore, has been nominated a member of the WHO Expert Advisory Panel on Nutrition.

● DR. S. L. KAPOOR, Asst. Director & DR. UMA SHANKAR, Senior Scientific Officer, NCL, Poona, have been nominated members of the Rubber Board, Ministry of Commerce and Industry.

(*Contd. on p. 4, col. 1*)

BRIEFS

Physics Conference and Symposium on Solid State Physics

The proceedings of the symposium on Solid State Physics held at the Indian Institute of Science, Bangalore under the auspices of the Physical Research Committee, CSIR, during Feb. 1-3, 1960 have been published. The symposium was held along with the conference of the Physical Research Committee.

The 216-page publication contains 74 papers on solid state physics presented to the symposium. Brief reports of the work done under research schemes sponsored by the Physical Research Committee in the field of physics and geophysics are also included. The various aspects covered by the papers are : Spectroscopy ; neutron scattering and the structure of solid state ; ferro-electricity and thermal expansion in solids ; elasticity and ultrasonics ; magnetic resonance phenomena ; magnetism ; optical properties of solids ; X-ray crystallography ; structures by X-ray methods ; and computers and ionizing radiations.

Development of Medicinal Plants—Zonal Conference

A zonal conference of the Central Indian Medicinal Plants Organization was held in Bangalore on May 22, 1961 with the object of working out means of developing medicinal and aromatic plants of the Southern region on commercial scale. Shri H.S. Rudrappa, Minister for Forests, Mysore State, inaugurated the conference. Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, presided. Representatives of Andhra Pradesh, Madras and Mysore States and other interested parties attended the conference.

Symposium on Food Need and Resources

The three-day symposium on Food Need and Resources organized by the National Institute of Sciences of India at the CFTRI, Mysore was inaugurated on May 18, 1961 by Dr. A.N. Khosla, Member, Planning Commission. Among the topics discussed were population trends and food requirements, food production programmes, conservation and better utilization of available food materials, subsidiary foods, and storage and transport of foods.

MPF Pilot Plant for Burma

A two-ton pilot plant for the manufacture of Multi-Purpose Food (MPF) based on the process developed by the Central Food Technological Research Institute, Mysore, may soon be installed in Burma. The Burma Christian Council Relief Committee deputed Mr. U. Kyaw Nyein of the Union of Burma Applied Research Institute, Rangoon, for training in the MPF manufacturing units at Mysore and Coimbatore.

Oil Companies Scholarships

The Council of Scientific & Industrial Research has selected the following candidates for higher training abroad under the scholarships awarded by the Burmah-Shell, the Assam Oil Company and the Standard Vacuum Oil Company.

Burmah-Shell Scholarships :

1. SHRI A. CHAKRAVARTI—*Coal Preparation*

2 & 3. SARVASHRI RAMINDRA PRATAP & K.S. NARASIMHAN—*Chemical Engineering*

Assam Oil Co. Scholarships :

4 & 5. SARVASHRI SUDHIR JAIN & S.K. MISHRA—*Geology & Geophysics*

6. SHRI U. W. DATEY—*Mining Engineering*

7,8 & 9. SARVASHRI T. V. ANJANEYULU, N.V. SARMA & S.V. SUBRAMANIAN—*Foundry Engineering*

10. SHRI A. K. JENA—*Physical Metallurgy or Ferrous Production Metallurgy*

Standard Oil Co. Scholarship :

11. SHRI Y.S. SURYANARAYANA—*Chemical Engineering*

These scholarship schemes, instituted by the Burmah-Shell Oil Storage Company and Assam Oil Company in 1952 (for studies in Commonwealth countries) and by the Standard Vacuum Oil Company in 1957 (for studies in U.S.A.), are administered by the CSIR.

Research Fellowships

The following have been awarded CSIR fellowships for research on projects noted against their names :

Senior Fellowship :

SHRI BASANTA KUMAR MAHATO—*Pressure leaching of copper ores and reduction of leach solution with reducing gas to produce copper metal* (College of Engineering & Technology, Calcutta).

Junior Fellowships :

1. SHRI TEJINDER SINGH—*Adrenal steroids and vitamin C in relation to diabetes* (Bikaner Medical College, Bikaner).

2. SHRI K.M.L. AGARWAL—*Investigation on the photosynthesis of amine acid* (University of Allahabad, Allahabad).

3. SHRI ANAND SWAROOP—*Chemotherapy of diabetes* (Lucknow University, Lucknow).

4. SMT. ADARSH M. KUMAR—*Carbohydrate metabolism as affected by the administration of sulpha drugs, paludrine and antibiotics* (Bikaner Medical College, Bikaner).

5. SHRI KALYAN BANDHU DATTA—*Change in cell chemistry following artificial treatment* (University College of Science, Calcutta).

6. SHRI DIBYENDU NATH ROY—*Synthetic studies in colchicine and analogues* (University College of Science, Calcutta).

7. SHRI K.N. MUNSHI—*Inorganic microchemistry using wisz ring technique* (University of Allahabad, Allahabad).

8. SHRI PARBATI PRASAD MAHAPATRA—*Non-aqueous acid-base titration* (Jadavpur University, Calcutta).

Research Schemes Terminated

The following research schemes have been terminated :

1. *Studies in synthetic perfumes*—Dr. K.S. Narang, Panjab University, Chandigarh (with effect from April 30, 1961).

2. *Study of moisture balance problems in micrometeorology*—Dr. T. Subramanyam, Andhra University, Waltair (w.e.f. May 31, 1961).

3 & 4. *Molecular spectra of halogens in the vacuum ultraviolet region ; Emission spectra of halogens and halogens magnetic resonance using super high resolution nuclear magnetic resonance spectrometer, etc.*—Prof. P. Venkateswarlu, Aligarh University, Aligarh (w.e.f. May 31, 1961).

5. *Low temperature X-ray crystallography*—Prof. R.S. Krishnan, Indian Institute of Science, Bangalore, (w.e.f. June 30, 1961).

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

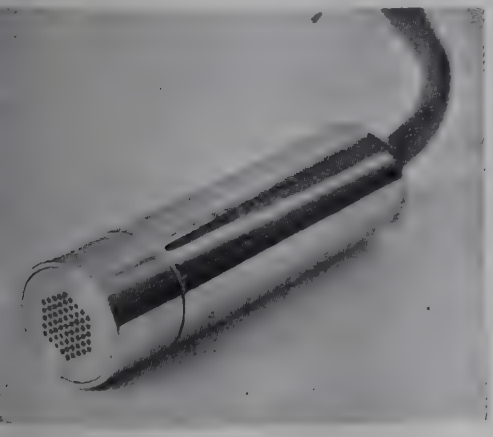
Synthetic Cryolite—Cryolite is one of the essential minerals required by the steel, ceramic and aluminium industries. The mineral is not found in India and its requirement (about 7500 tons per annum) is met by imports from Denmark and Greenland.

The production of cryolite from low-grade fluorspar containing high percentage of silica has been investigated at the Laboratory. High silica fluorspar—unsuitable for the production of hydrogen fluoride—is available in Rajasthan (Dungarpur Dt.), Madhya Pradesh (Drug. Dt.), and Bombay (Baroda Dt.).

For producing cryolite, low-grade fluorspar is first beneficiated to metallurgical grade fluorspar. High grade cryolite can be obtained by the interaction of metallurgical grade fluorspar with sulphuric acid and boric acid through the intermediate formation of fluoboric acid and subsequent precipitation of cryolite by the interaction of fluoboric acid with hydrated alumina and sodium carbonate. The reaction can be carried out in an open tank as the fluoboric acid solution is sparingly volatile. In the process, boric acid can be regenerated and reused and high grade gypsum is obtained as a by-product.

CEERI, PILANI

Condenser Microphone—A miniature condenser microphone suitable for use in high quality sound systems and for measurement of sound pressures has been designed and fabricated. The microphone has a uniform frequency response (pressure response) in the range of 40 to 10,000 c/s. within ± 2.5 db. Its sensitivity is —55 db. for 1 volt per dyne per sq. cm. of sound pressure on the diaphragm. Measurements taken at the Laboratory show that the condenser microphone does not produce distortion even at sound pressure levels of 130 db.



CEERI, PILANI—Condenser microphone with cathode carrier

RRL HYDERABAD

Korvi Earth—Experiments were conducted at Chittaranjan jointly with the Research, Designs and Standards Organisation (Ministry of Railways) to assess the suitability of raw earth from Korvi (Mysore State) for reclamation of highly contaminated used diesel engine oils, using the units supplied by M/s. *Sparkles Manufacturing Co.*, Mundelin, Illinois, U.S.A. The raw earth from Korvi has been found to be more efficient to an imported earth.

RRL, JAMMU

Streptomyces monicaeny—A new species of Streptomyces, named *S. monicaeny*, possessing a broad antibacterial spectrum has been isolated from local soils. The species belongs to *S. reticuli* group of bacteria, but differs from other species of this group in its cultural and physiological characteristics. It produces both primary and secondary whorls on various media.

Antibacterial properties of the species have been studied. It inhibits the growth of *Staphylococcus aureus, Escherichia coli, Salmonella paratyphi. Klebsiella pneumoniae, Shigella flexneri* and *Mycobacterium phlei.* It is active against the stains of *Staphylococcus aureus* which are resistant to penicillin, streptomycin, chloramphenicol, tetracycline and erythromycin.

Sponsored Research

Spectrographic Investigations of Ocean Bed Samples—Nature of ocean sedimentation, the constituent elements of the sediments and their relative abundance in different zones of ocean bed at different depths have been investigated spectrophotometrically.

Analysis of the sediments showed that in addition to major elements like Si, Al, Fe, Ca, Mg, Na, K and Ti, 28 minor elements like Pb, W, Zr and Be are present in varying proportions. The proportion of lead increases from the shell zone (30-70 fathoms) to Oolite zone (70-100 fathoms) and from the Oolite zone to the zone beyond the continental shelf probably due to the fact that lead is radiogenic and is found as a stable decay product of uranium and thorium — P. TIRUVENGANNA RAO & S. V. J. LAKSHMAN, Andhra University, Waltair (May 1956-June 1960).

Studies in Indian Lichens—Work on the scheme, *Studies on the pigments of Indian lichens* has been completed. The lichen, *Roccella montagnei* has been found to contain a high concentration of β-carotene and ergosterol, and a simple method for the isolation of these components has been developed. Ergosterol is found in *Usnea venosa* mot. and *Ramalina tayloriana.* A hitherto unreported phenolic substance occurring in *Parmelia tinctorum* has been characterised as methyl β-orcinol carboxylate—S. RANGASWAMI, Andhra University Waltair.

Research Papers

Synthesis of calycotomine analogues under physiological conditions —(Mrs.) A. Chatterjee & N. Adityachaudhury, University College of Science and Technology, Calcutta. *Naturwissenschaften*, **47** (1960), 206.

Beta-phenylethanol amines : Pt. II —Studies on cyclodehydration of a few acylaminoalcohols—N. Adityachaudhury, S. K. Srimany & (Mrs) A. Chatterjee, University College of Science & Technology, Calcutta. *J. Indian chem. Soc.*, **38** (1961), 15.

Urinary adrenaline and noradrenaline—M. Ashwini Kumar, F. N. Shroff, J N. Balwani, U. K. Sheth & Jal R. Patel, Seth G. S. Medical College, Bombay. *Indian J. med. Res.*, **49** (1961), 73-81.

Effect of certain steroids and other compounds on sodium reflex from erythrocytes—M. Ashwini Kumar & U. K. Sheth, Seth G. S. Medical College, Bombay. *J. Endocrin.*, **21** (1961), 453-58.

Statistics in medical science—M. Ashwini Kumar & U. K. Sheth, Seth G. S. Medical College, Bombay. *Indian J. med. Sci.*, **15** (1961), 259.

Preferential inhibition of phosphorylations in respiratory chain in mitochondria of animals injected with cobra venom—I. Aravindakshan & B.M. Braganca, Indian Cancer Research Centre, Bombay. *Biochem. J.*, 79 (1961), 80.

Studies on phospholipid structure in mitochondria of animals injected with cobra venom or phospholipase A—I. Aravindakshan & B.M. Braganca, Indian Cancer Research Centre, Bombay. *Biochem. J.*, 79 (1961), 84.

PERSONAL

(*Contd. from p. 1, col. 3*)

● SHRI A.K. DEB, Senior Scientific Officer, CBRI, Roorkee, has been nominated a member of the Soil Research Committee of the Indian Roads Congress.

● The following officers have been nominated members of the Committee/Panel of the Indian Standards Institution :

SHRI S. S. BHATNAGAR, Senior Scientific Officer, NML, Jamshedpur—*Ferrous Metals for Automobiles Sub-Committee.*

DR. T. BANERJEE, Deputy Director, NML, Jamshedpur—*Electroplating Sectional Committee.*

SHRI G. D. JOGLEKAR, Asst. Director, NPL, New Delhi—*Secondary Cells & Batteries Sectional Committee (Chairman).*

SHRI J.V. NAGARAJA, Senior Scientific Officer, NPL, New Delhi—*Fluid Flow Measurement in Closed Conduits Sub-Committee.*

DR. S. K. BARAT, Asst. Director, CLRI, Madras—*Panel for Salt & Marine Products.*

● The following CSIR research fellows who were working under Prof. Santi R. Palit, Indian Association for the Cultivation of Science, Calcutta, have been awarded Ph. D. degrees in Science. The details are given below :

DR. M.L. BHASKARA RAO (now at CECRI, Karaikudi)—*Physico-chemical studies on Synthetic Polymeric Ampholytes and their Derivatives* (Calcutta University).

DR. V. LINGAMURTHY (now at Central Research Laboratory, Dalmianagar)—*Studies of Metallic Compounds as Inhibitors of Polymerization* (Calcutta University).

DR. CH. KALIDAS (now at CFRI, Jealgora)—*Acid Base studies in Non-aqueous Media* (Jadavpur University).

PATENTS & PROCESSES

Applications Filed

74680 : *Improvements in or relating to the electrolytic derusting of corroded metal parts*—K.S. Rajagopalan, N. Subramanyam & Y.V.P.R. Row, CECRI, Karaikudi.

76017 : *Solvents and heat exchange liquids from cashewnut shell liquid*—S.C. Sethi, L. K. Doraiswamy & B.C.S. Rao, NCL, Poona.

76414 : *Improvements in the separation of silica from alkaline solutions*—A. V. Rajeswara Rao, V. Venkatesham, D. S. Datar, S. H. Zaheer & Majeed Mohiuddin, RRL, Hyderabad.

76415 : *Improvements in or relating to the modification of aluminium alloys containing silicon*—S. S. Bhatnagar, P. K. Gupte, B. R. Nijhawan & G. G. Nair, NML, Jamshedpur.

76416 : *A process for the production of efficient fuel from lignite and anthracite from Jammu and Kashmir State*—D. K. Rao, D. P. Agrawal, K. S. Rao, M. G. Krishna & S. H. Zaheer, RRL, Hyderabad.

76516 & 76517 : *Improvements in or relating to the process of manufacture of protein and oil from groundnuts and other oil seeds*—CFTRI, Mysore.

76557 : *Central stimulants of the type of secondary and tertiary aminophenyl propionate and propanols*—R. S. Kapil, S. N. Mehra, Man Mohan Vora, J. D. Kohli & Nitya Anand, CDRI, Lucknow.

76682 : *A process for the recovery and purification of anthracene, carbazole and phenanthrene and allied chemicals from coal tar fractions in highly concentrated or pure state*—D. K. Sen, C.S.B. Nair, A. N. Basu & A. Lahiri, CFRI, Jealgora.

Applications Accepted

68869 : *Improvements in and or relating to the manufacture of benzidine and substituted benzidines*—H. V. Udupa, G. S. Subramanian & K. S. Udupa, CECRI, Karaikudi.

69250 : *Improvements in or relating to the manufacture of abrasive articles*—V. Nagarajan & R. T. Thampy, Shri Ram Institute for Industrial Research, Delhi.

Applications Sealed

66095 : *A new method for production of diesel oil from coal-tar and coal-tar fractions* —N. G. Basak, S. K. Bose, A. Ganguly & A. Lahiri, CFRI, Jealgora.

66836 : *Manufacture of ethylene dichloride*—S. C. Banerjee, S. L. Phatak, M. U. Pai & L. K. Doraiswamy, NCL, Poona.

67779 : *A process for briquetting of non-caking coal slacks and carbonization of briquettes to produce a strong coke*—S. H. Zaheer, D. P. Agrawal, D. K. Rao & M. G. Krishna, RRL, Hyderabad.

Magnetic Fluid for Crack Detection

Magnetic fluid used in the detection of cracks in ferrous metals is not produced in India.

The National Physical Laboratory, New Delhi has developed two processes for its manufacture utilizing indigenous raw materials. The processes (Indian Pat. Nos. 50574 & 61774), in the first step, consist in the preparation of magnetic iron oxide from (i) magnetite ore and (ii) ferrous sulphate and oxalic acid respectively. For making magnetic fluid, the iron oxide is mixed with aluminium stearate, calcium oleate and distilled kerosene oil in requisite proportions.

The capital out lay for a plant of 500 kg. per month capacity is Rs. 10,000 with running cost (including raw material, labour, depreciation, etc.) of about Rs. 5 per kg. The cost of magnetic fluid has been estimated Rs. 1.00 per litre approximately.

Parties interested in the commercial development of the product may obtain details of the processes, free of charge, from the Director, NPL, New Delhi.

Rubber Base Contact Adhesive

Technical details of the process for the manufacture of rubber base contact adhesive developed at the National Chemical Laboratory, Poona (*CSIR News*, Vol. 11, No. 8, p. 4) are available for commercial exploitation. Parties interested in the development of the process may correspond with the Director, National Chemical Laboratory, Poona.

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CSIR NEWS

VOL. 11 NEW DELHI—JUNE 26, 1961 ASADH 5,

DR. K. S. KRISHNAN PASSES AWAY

We regret to record the sudden demise, due to heart failure, of Dr. K. S. Krishnan, F.R.S., Director, National Physical Laboratory, New Delhi on Wednesday June 14, 1961 at his residence, 3-Kushak Road, New Delhi. Dr. Krishnan was 63.

Soon after the news of his demise, the Vice-President of India, Central Ministers and several prominent statesmen and scientists called at his residence. Messages of condolence were received, among others, from the President and the Prime Minister of India.

Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, who was one of the earliest to arrive at his residence, personally supervised all the funeral arrangements.

Wreaths were placed on the body of the departed soul on behalf of the President, the Prime Minister, Ministry of Scientific Research & Cultural Affairs, Council of Scientific & Industrial Research, National Physical Laboratory, Central Road Research Institute, Atomic Energy Commission, University Grants Commission, Unesco and other organizations.

The offices of the CSIR Secretariat, National Physical Laboratory, Central Road Research Institute, Ministry of Scientific Research & Cultural Affairs, University Grants Commission and Atomic Energy Commission remained closed on June 14, as a mark of respect to the memory of Dr. Krishnan.

A meeting to condole the death of Dr. Krishnan was held at the CSIR Secretariat, New Delhi on June 15, 1961. Prof. M. S. Thacker who presided over the meeting referred to his close association with Dr. Krishnan since 1932. He made pointed reference to Dr. Krishnan's human values besides his being a scientist of international repute.

Shri P.M. Sundaram, Secretary, CSIR, read the following resolution on behalf of the CSIR :

"This meeting of the officers and staff of the Council of Scientific & Industrial Research wishes to express their deep sense of sorrow on the sudden and premature passing away of Dr. K.S. Krishnan, F.R.S., who has been Director, National Physical Laboratory since 1947, when the Laboratory was established. In his death not only the Council but the country as a whole has suffered a grievous loss, since Dr. Krishnan

was not only an eminent scientist but a great savant of humanities, especially of Tamil and Sanskrit literature. He had been closely and intimately associated with the CSIR in all its developmental schemes not only as Director of the National Physical Laboratory but also as a member of the Board of Scientific & Industrial Research, the Governing Body and various committees.

"The meeting wishes to convey their sincere condolences on this sad occasion to Mrs. Krishnan and other members of the bereaved family."

Resolutions to condole the death of Dr. Krishnan were passed by the CSIR Staff Association, CSIR Unit of the Association of Scientific Workers of India, NPL Scientific & Technical Staff Association and members of NPL Staff and NPL Club.

Life Sketch

Kariamanikkam Srinivasa Krishnan was born in the village of Watrap near Srivilliputtur in the Ramnad Dt., Madras State, on Dec. 4, 1898. After early schooling in Watrap and Srivilliputtur, he studied in the American College at Madurai and later in the Christian College, Madras. After graduating in physics from the Christian College, he was for a few years a demonstrator in the same college.

Dr. Krishnan then proceeded to Calcutta to work under Prof. C.V. Raman at the Indian Association for the Cultivation of Science (1923) and absorbed from the distinguised teacher an abiding interest in optics and molecular physics. In 1928, Dr. Krishnan joined the Dacca University as Reader and published a number of scientific papers during his 6 years' stay there. When Prof. Raman left Calcutta in 1933, Dr. Krishnan was invited to take up the post of Mahendralal Sircar Professor of Physics in the Indian Association for the Cultivation of Science. In 1942, he was offered the post of Professor of Physics in the University of Allahabad. Dr. Krishnan was appointed Director of the National Physical Laboratory, New Delhi in 1947, which post he held until his death.

Research Work

The period of Dr. Krishnan's stay at the Indian Association for the Cultivation of Science was one of exceptional activity.

He made a thorough experimental study of the scattering of light in a large number of pure liquids, worked on many problems in the classical theory of the diffraction of light and started work on the magnetic anisotropy of gaseous molecules and of crystals. He collaborated with Professor Raman in making a detailed examination of the change in the nature of the light which was found to be associated with molecular scattering. As is well known, these studies led to the discovery of the Raman Effect.

During his stay in the DaccaUniversity (1929-33), Dr. Krishnan conducted intensive studies on the diamagnetic and paramagnetic crystals. The work of Dr. Krishnan and his students established the fruitfulness of magnetic methods as a valuable supplement to the methods of X-ray analysis for determining the crystal structure.

As Professor of Physics in the Indian Association for the Cultivation of Science (1933-42) and the Allahabad University (1942-47) he carried out pioneering researches on the magnetic and optical properties of crystals, statistical thermodynamics, quantum theory and wave mechanics.

Under the inspiring leadership of Dr. Krishnan notable achievements have been made by the National Physical Laboratory in several fields of physics.

His researches at the Laboratory have been mainly on the physics of the solid state. Studies on the thermionic properties of metals and semi-conductors was one of the lines of work. He developed a new technique which dispenses with the need for degassing the surface and enables not only the thermionic constants, but their temperature coefficients too to be determined with precision. Using this technique, the thermionic constants of several metals and semi-conductors have been measured. The experimental methods developed in the course of thermionic studies have become more or less standard methods for the determination of the spectral and total emissivities of metals.

The next problem of significance which Dr. Krishnan investigated was the mathematical solution of the distribution of temperature along an electrically heated filament. This solution led to the development of a new experimental method for determining the thermal conductivity of metals.

The problem of temperature distribution along a heated tube was also solved. An interesting side result of this was the construction of radiation standards suitable for calibrating an extended thermopile.

Theoretical investigation followed by experimental work on the electrical conductivities of metals and alloys led to several results of interest in pure mathematics.

Extensive investigations on the frequency and anharmonicity of some of the normal modes of vibration of ionic crystals were made; these provided an insight into the effect of polarisation field on the refractivities of dense media and this resolved the long standing controversy regarding the merits of the dispersion formulas of Lorentz and Drude as mathematically equivalent.

Honours

Dr. Krishnan's contributions to physics were recognized as early as 1937 by the invitations he received from Lord Rutherford in Cambridge and Sir William Bragg in London to give a course of lectures in the Cavendish Laboratory and in the Royal Institution. He later visited a number of universities in Europe and was awarded the Liege University Medal for his scientific achievements. In 1939, he was invited to participate in an International Symposium on Magnetism at Strasbourg. Dr. Krishnan was elected a Fellow of the Royal Society in 1940. He was knighted in 1946.

In 1956, Dr. Krishnan was elected a foreign Associate of the National Academy of Sciences, U.S.A.

In recognition of Dr. Krishnan's contributions towards the development of science the Government of India honoured him with *Padma Bhushan* in 1954 and later in 1958 appointed him National Professor.

On March 24, 1961, Prime Minister, Shri Jawaharlal Nehru presented him the first Shanti Swarup Bhatnagar Memorial Award instituted by

(*Contd. on p. 4, col. 1*)

BRIEFS

Seminar on Electrochemistry

The third seminar on Electrochemistry will be held at the Central Electrochemical Research Institute (CECRI), Karaikudi sometime in December 1961. The last seminar was organised by the Institute during December 1960 (*CSIR News*, Vol. 10, No. 7, p. 1).

Contributions on various disciplines of theoretical and applied electrochemistry including personal experiences and data collected in the operation of electrochemical plants are invited from scientists and technologists in India and abroad.

Intending participants to the seminar are requested to send the abstracts of papers (in triplicate) to the convener of the seminar, Shri V. Aravamuthan, Asst. Director, CECRI, by Sept. 15, 1961. Full papers (in duplicate) should reach by Nov. 15, 1961.

Manufacture of Book Binding Skivers and Chamois Leather

A practical demonstration of the process of manufacture of book binding skivers and chamois leather from goat skin splits will commence on July 24, 1961 at the Central Leather Research Institute (CLRI), Madras.

Organizations and tanneries desirous of sending their representatives for attending the demonstration may correspond with the Director, CLRI, Madras.

Research Fellowships

The following have been awarded CSIR Fellowships for research in schemes noted against their names :

Senior Fellowships :

1. Dr. B. B. Nath—*Studies on Indian plant gums* (Jadavpur University, Calcutta).

2. Shri Rajinder Kumar—*Oxidation of acetaldehyde and acetic acid* (Indian Institute of Science, Bangalore).

Junior Fellowships :

1. Shri Jata Dhari Pandey—*Chemical reaction initiation by ultrasonic waves* (University of Allahabad, Allahabad).

2. Smt. Kamalapany Dey—*Respiratory activity of the germinating rice embryo* (Calcutta University, Calcutta).

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Aluminising of Hard Wares—Conditions have been worked out for aluminising the U-Back and Stalks—used for telegraph pole lines—by experimenting on the hot-dip aluminising pilot plant of the Laboratory.

The aluminised articles could bear 5-6 dips in copper sulphate solution whereas galvanised materials showed deposits of copper in first or second dip. The aluminised articles, when subjected to salt spray test for 100 hr, showed better resistance resulting in lesser loss in weight.

The aluminised articles will be tested for their life service against atmospheric corrosion by the Post and Telegraph Department with a view to assess their superiority over the conventionally used galvanised articles.

Sponsored Research

Degradation of Jute Fibre by Micro-organism—Growth of fungi on the surface and within the lumen of jute fibre has been investigated microscopically by a technique developed using Chlorazol Sky Blue stain.

The growth of fungi in lumen is most common when deterioration of jute takes place under weather exposure. Many dark-coloured fungi of the *Dematiaceae* family which withstand the lethal effect of sunlight grow in moist conditions. Lumen growth is rare in fabrics damaged in storage, however, one strong lumen invader, *Thielavia sepedonium*, has been isolated. This organism is also found on jute fibre decomposing in contact with soil. *Chaetomium* species are the dominant lumen-growers under exposure conditions of 100 per cent relative humidity.

Granular bodies seen within the lumen of raw jute are traced to the growth of a *Bacillus* species, which have been isolated and identified—S.N. Basu, Indian Jute Mills Association Research Institute, Calcutta.

Lac Dye for Colouring Fibres—Commercial feasibility of lac dye for colouring viscose, wool, silk and nylon yarns has been investigated.

The study has shown that lac dye can be applied to viscose fibre by the premordanting process only. The shades obtained have poor to moderate fastness.

The dye can be used for colouring wool and silk by both the premordanting and after mordanting processes. Shades from red, purple, violet to brown, gray and black can be produced using different mordants. The shades are fast to light and washing.

Various shades on nylon can be obtained by the use of lac dye with different mordants and fixing agents. Yarn fast to light and washing may be produced by both the pre- and after-mordanting processes — The Silk & Art Silk Mills' Research Association, Bombay.

Research Papers

Research on materials at the Central Building Research Institute—A.C. Banerjee, CBRI, Roorkee. *Indian Build.*, **9** (1961), 29—31.

Acoustics of building materials—V. Narasimhan, CBRI, Roorkee. *Indian Archit.*, **11**. (1961), 29-33.

Differential thermal analysis as applied to study of thermal efficiency of kilns—V.S. Ramachandran & N.C. Majumdar, CBRI, Roorkee. *J. Amer. ceram. Soc.*, **44**, (1961), 95.

Lime blowing and mechanism of docking—V.S. Ramachandran, N.C. Majumdar & N.K. Patwardhan, CBRI, Roorkee. *Claycraft (Lond.)*, **34** (1961), 169-170.

Bloated clay aggregate from Palta silt—S.K. Chopra & Kishanlal, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961), 76.

Size effect in field plate loading tests for bearing capacity of soils—A.K. Deb, H.N. Anand & V.S. Agarwal, CBRI, Roorkee. *J. natl Build. Org.*, **6** (1961), 15-21.

Effect of moisture on the bearing capacity and settlement of soils—H.N. Anand, A.K. Deb & B. Rao, CBRI, Roorkee. *J. natl Build. Org.* **6** (1961), 23-31.

Search for new antimalarials : Pt VII—A.B. Sen & P.R. Singh, Lucknow University, Lucknow. *J. Indian chem. Soc.*, **38** (1961), 187.

PATENTS & PROCESSES

Applications Filed

INDIA

76018 : *Bilcrete: A new hydrophobic cement*—S.K. Chopra & C.A. Taneja, CBRI, Roorkee.

76515: *Improvements in or relating to the process of manufacture of protein and oil from groundnuts and other oil seeds*—CFTRI, Mysore.

76683: *Improvements in or relating to techniques for filling long narrow tubes with fine materials*— G.D. Joglekar, Daneswar Sen & S.K. Kapoor, NPL, New Delhi.

Applications Accepted

68401: *A pneumatic or such other forge hammer adapted for the manufacture of bricks or blocks out of ceramic mixes*—H.V. Bhaskar Rao, H.P. Srinivasamurthy & R.C. Verma, NML, Jamshedpur.

68680: *Improvements in low temperature carbonisation practice as related to narrow continuous vertical retorts*—K.Y. Shrikhande, H.C. Chakrabarti, V.V. Rao, N.N. Das Gupta, S.K. Das Gupta, S. Chatterjee & A. Lahiri, CFRI, Jealgora.

69619: *A mechanical area integrator for the measurement of the cross-sectional area of mine-roadway or the like* — M.D. Shamsuzzoha, CMRS, Dhanbad.

69782: *Improvements in or relating to production of citric acid from saccharine materials*—B. S. Lulla & S.H. Zaheer, RRL, Hyderabad.

Applications Sealed

INDIA

65891 : *A process for the conversion of coal tar or coal tar fractions to high speed diesel oil and gasoline*—S.K. Bose, N.G. Basak, A. Ganguly & A. Lahiri, CFRI, Jealgora.

66953 : *Process for preparation of ethylene oxide*—H. Ibrahim, V.V. Deshpande & N. R. Kuloor, Shri Ram Institute for Industrial Research, Delhi.

U. K.

858110 : *A new process for the production of 4-hydroxycoumarin and its derivatives*—V. R. Shah, J.L. Bose & R.C. Shah, NCL, Poona.

(*Contd. from p. 2, col. 2*)

the CSIR for outstanding work in the field of science.

Dr. Krishnan was associated with the work of many national and international scientific bodies. He was a Fellow of the Institute of Physics, London; Fellow of the Royal Society of Arts, London; and Fellow of the Institute of Metals, London. Dr. Krishnan was President, Section of Physics, Indian Science Congress in 1940 and its General President in 1949. He was Chairman, Scientific Advisory Committee, Unesco; Vice-President, International Council of Scientific Unions and of International Union of Pure and Applied Physics; Chairman, Indian National Committee, URSI; Chairman, Indian National Committee for IGY; and Chairman, Sub-Commission for Cooperation with Unesco. He was Chairman, Board of Research in Nuclear Science, Member, Atomic Energy Commission, the University Grants Comission, and the Standing Board of Astronomy. His association with the Council of Scientific and Industrial Research dates back to its inception. He served the Council in various capacities, as member of the Governing Body, Board of Scientific & Industrial Research, Board of Engineering Research, Editorial Board of the Journal of Scientific & Industrial Research and was a member of many Research Committees. Since 1947, as Director, National Physical Laboratory, he was more intimately connected with the work of the Council.

Apart from his interest in science, Dr. Krishnan was a great scholar in Tamil, Sanskrit and Hindu religious lore.

PERSONAL

●SHRI K. G. KRISHNAMURTHI, Technical Secretary, CSIR, New Delhi, left for France on June 19, 1961 under the Indo-French Technical Cooperation Agreement. During his 4-week stay in France he will visit scientific and industrial research organizations and study the planning, organization and execution of research programmes and projects. Later, he will proceed to U.K. (for 15 days) and visit some of the DSIR research establishments for studying the methods and procedures followed in these institutions.

THE LAST JOURNEY: Picture shows Prof. M. S. Thacker, Dr. D.S. Kothari, Dr. K.N. Mathur, Shri P.M. Sundaram and others carrying the bier

●SHRI Y. R. CHADHA, Scientific Reporter, Publications Directorate, CSIR, New Delhi, left for U.K. on June 19, 1961 under the Colombo Plan for 10 months' training in methods of handling technical enquiries on raw materials of economic and industrial importance. He will also study the techniques of compiling and publishing monographs on such materials.

●SHRI N.V. RAMAN, Junior Scientific Officer, CBRI, Roorkee, resumed duties with effect from June 6, 1961 after completion of his training in Structural Engineering in the University of Melbourne, under the Colombo Plan.

* * *

●PROF. K. R. RAMANATHAN, Director, Physical Research Laboratory, Ahmedabad and Chairman, Advisory Committee of Rain & Cloud Physics Research Unit, and Member, Radio Research Committee, CSIR, has been awarded the *International Meteorological Organization Prize* for 1961 for outstanding work in meteorology and international collaboration.

●DR. V.R. KHANOLKAR, Director, Indian Cancer Research Centre, Bombay and Member, Biological Research Committee, CSIR, has been elected an Honorary Member of the *Academy of Medical Sciences*, U.S.S.R.

Dr. H. S. Rao

Dr. H.S. Rao has been appointed, on promotion, Assistant Director, CFRI, Jealgora, with effect from May 13, 1961,

Dr. Rao (*b.* 1926, Karkala, Mysore State) graduated in 1945 with distinction and obtained M. Sc. degree in Chemistry and a diploma in Chemical Engineering from the University of Travancore. After working for a year (1948) in the gas plants of Messrs. Fertilizers and Chemicals Ltd., Alwaye, he joined (1949) the Indian Association for the Cultivation of Science, Calcutta. In 1951, he left for U.S.A. for higher studies under Professors Richard C. Lord and Herbert O. House, and was awarded the degree of Doctor of Science by the Massachusetts Institute of Technology (1956). For some time he worked as Research Associate at the Gillete Razor Blade Co., Boston. After returning to India, he joined the Central Fuel Research Institute in February 1957 as Senior Scientific Officer.

Dr. Rao has done extensive work on the synthesis of small ring hydrocarbon molecules and their deuterium derivatives. He has published a number of papers in the fields of organic synthesis, infrared spectroscopy, Raman spectroscopy and nuclear magnetic resonance spectroscopy.

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R. N. 4212/5

CSIR NEWS

VOL. II NEW DELHI—JULY 10, 1961 : ASADH 19, 1883 No. 13

DIRECTORS' CONFERENCE

A two-day conference of the Directors of national laboratories and cooperative research associations of industries was held at the CFTRI, Mysore on June 29-30, 1961. Prof. M. S. Thacker, Director-General, Scientific & Industrial Research, presided.

In opening the conference, Prof. M.S. Thacker referred to the great loss which science had sustained in the death of Dr. K.S. Krishnan. The members passed a condolence resolution expressing their deep feelings of grief and sorrow, at the sudden passing away of Dr. Krishnan.

The conference conveyed their respectful greetings to Shri Jawaharlal Nehru, Prime Minister and President of CSIR, under whose inspiration and encouragement the Council has made substantial progress in recent years.

In reply to the message, the Prime Minister sent the following telegram to Prof. Thacker :

"Thank you for your message. I send you and the Directors of our national laboratories my greetings and good wishes. These central institutes have played a great part in the advancement of science in India, both in research work and in its practical application. The future of India depends, I think, on our development of the climate of science in this country and our laboratories and institutes have therefore a tremendous part to play".

Reviewing the work of the Council, Prof. Thacker declared that the results achieved by the national laboratories have been substantial, and several new processes and products have been developed for the utilization of natural resources and many of them have been used by industry. He stated that industries in India have begun to take greater interest in research as is evidenced by the formation of cooperative research associations.

The conference discussed the progress of research in the national laboratories and steps taken for gearing the work to national development projects under the Third Five-Year Plan.

With a view to augment opportunities for scientific and technical training and attract young men and women to a scientific career, it was decided that the number of research fellowships should be increased and apprenticeship schemes established in laboratories with pilot plant and workshop facilities. It was also decided that a brochure on research as a career should be published in order to attract capable young people to take to science as a vocation.

Prof. M.S. Thacker

Prof. M.S. Thacker, Secretary, Ministry of Scientific Research & Cultural Affairs and Director-General, Scientific & Industrial Research has been nominated, by the Government of India, Chairman of the Committee constituted to consider and recommend to the Government measures to be taken to encourage the development of research in industries as well as the promotion of consultancy firms.

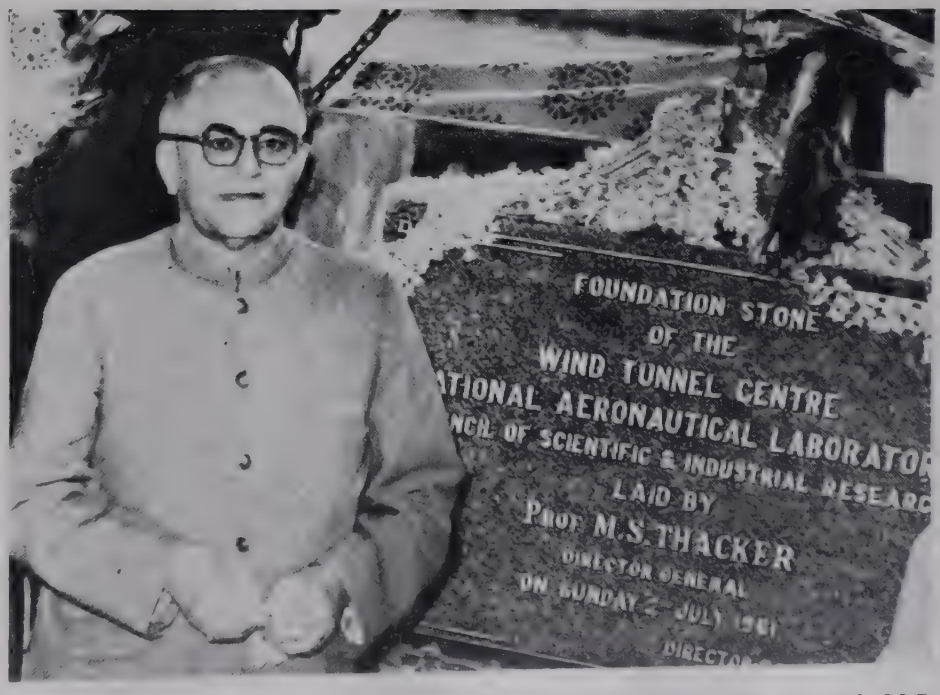
* * *

The President, Council of Scientific & Industrial Research has decided that consequent on the death of Dr. K.S. Krishnan, Director, NPL, New Delhi and pending the appointment of his successor, the Director-General, Scientific & Industrial Research will, in addition to his duties, look after the work of the Director, NPL, New Delhi.

Wind Tunnel Centre—Foundation Laid

Prof. M. S. Thacker, Director-General, Scientific & Industrial Research laid the foundation stone of the Wind Tunnel Centre of the National Aeronautical Laboratory, Bangalore, at Belur near Hindustan Aircraft Limited on July 2, 1961.

Dr. P. Nilakantan, Director, NAL, in requesting Prof. Thacker to lay the foundation stone stated that the Centre will be located on a 100-acre plot and will have



WIND TUNNEL CENTRE, BANGALORE—Foundation Stone laid by Prof. M.S. Thacker, Director-General, Scientific & Industrial Research

adequate number of modern wind tunnels necessary for transonic, supersonic and hypersonic aerodynamics research. He expressed his thanks for the cooperation the Laboratory had from the Indian Institute of Science, Bangalore and Hindustan Aircraft Limited, Bangalore.

Prof. Thacker congratulated the Laboratory on its venture and stressed the significance of the Wind Tunnel Centre for research in aerodynamics.

MEETINGS

A meeting of the *Executive Council* of the *Regional Research Laboratory*, Jorhat, Assam will be held at the Laboratory on July 15, 1961 at 3.00 p.m. Shri B.P. Chaliha, Chief Minister, Assam State, will preside.

A meeting of the *Executive Council* of the *Central Building Research Institute*, Roorkee, will be held in the CSIR Secretariat, New Delhi on July 19, 1961 at 11.00 a.m. Shri N. Dandekar will preside.

A meeting of the *Executive Council* of the *Central Salt Research Institute*, Bhavnagar, will be held at the Committee Room of the Sachivalaya, Ahmedabad, on July 29, 1961 at 3.00 p m. Dr. Jivraj N. Mehta, Chief Minister, Gujarat State, will preside.

A meeting of the *Chemical Research Committee* will be held at the Indian Institute of Science, Bangalore, on July 22 & 23, 1961 at 2.00 p.m. Dr. B.C. Guha, University College of Science & Technology, Calcutta, will preside.

Symposium on Medicinal and Aromatic Plants

A symposium on 'Production and Utilization of Medicinal and Aromatic Plants in India' will be held at the Regional Research Laboratory, Jammu during Nov. 27-28, 1961. The symposium will cover the following aspects :

(1) Distribution, collection and cultivation of medicinal and aromatic plants in India

(2) Improvement of plants by selection, hybridization and induced mutations

(3) Pests and diseases and their control

(4) Chemistry, biochemistry and commercial utilization

(5) Pharmacological and microbiological studies on various extractives or pure active principles of plants

(6) Insecticidal, insect-repellant, pesticidal and fungicidal properties of plants

(7) Statistics regarding the availability, consumption, import and export of medicinal and aromatic plants.

Abstracts of papers intended for presentation at the symposium should be sent to the Deputy Director, Regional Research Laboratory, Jammu by Aug. 15, 1961 and full papers by Sept. 15, 1961.

CECRI, KARAIKUDI—Prof. M.S. Thacker, distributing the certificates to the trainees who completed course on Electroplating

BRIEFS

CECRI, Karaikudi

Prof, M. S. Thacker, Director-General, Scientific & Industrial Research visited the CECRI, Karaikudi on June 26, 1961. At a special meeting, he distributed the certificates to trainees who completed the 3 months' course on Electroplating at the Institute.

The trainees represented the following organizations : (i) Directorate of Industries, U.P., (ii) Office Equipment Corporation, New Delhi, (iii) Atomic Energy Establishment, Trombay, (iv) Hindustan Vehicles Limited., Patna, (v) Amco Batteries (Private) Limited, Bangalore and (vi) Ramnarain Ruia College, Bombay.

Time Please

A 16-page popular illustrated brochure on the Time and Frequency Standardisation Project of the National Physical Laboratory has been recently brought out by the Publications Directorate, CSIR, New Delhi. The brochure gives the establishment and significance of the Standard Time & Frequency Broadcast Station set up by the Laboratory at Kalkaji in Delhi.

The Station, known by the call sign ATA, provides a standard time and frequency broadcasting service for the South and South-East Asia region and is the twelfth international station of its kind. The ATA gives off discrete ticks for every second, minute and quarter-hour on the 30-metre band and a voice announcement every quarter-hour for two hours between 11.00 and 13.00 hrs. The accuracy of the time broadcast is within five-hundredth of a second.

IGY News-Letters

The Indian National Committee for the IGY has issued News-Letters Nos. 31 & 32.

News-Letter No.31 (June 7, 1961) is devoted to the proceedings of the symposia on 'IGY Data' and 'Upper Atmosphere' organized by the Indian National Committee for IGY during February 1961. Eighty-eight papers presented at the symposia are listed.

News-Letter No. 32 (June 9, 1961) outlines the important scientific programmes of the IGY for the years to come and records the recommendations of the National Committee for undertaking thorough magnetic survey of India (during 1961-65) and oceanographic and ionospheric investigations.

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Up-grading of Fluorspar— Beneficiation studies have been carried out on a low-grade calcitic fluorspar sample (assaying CaF_2, 24.9; $CaCO_3$, 27.0; SiO_2, 45.0; Al_2O_3, 1.13; Fe_2O_3, 0.70; Pb, 0.03; and S, 0.2 per cent) from Matamagri deposit in Dungarpur Dt. (Rajasthan). Straight flotation followed by three cleanings yielded a metallurgical grade of concentrate assaying CaF_2, 90.93; $CaCO_3$, 7.05; and SiO_2, 1.14 per cent with a CaF_2 recovery of 74.8 per cent.

Heavy media separation of the $-\frac{3}{4}$. in+10 mesh sample at 2.65 specific gravity rejected 50.1 per cent by weight of the ore in the float in which elimination of $CaCO_3$ was 70 per cent and loss of fluorspar was 9.7 per cent. Flotation performed with the sink after mixing with the —10 mesh untreated fraction, yielded a refloat concentrate assaying 92.35 per cent CaF_2, 4.8 per cent $CaCO_3$, 1.14 per cent SiO_2 with CaF_2 recovery of 73.2 per cent.

CGCRI, CALCUTTA

Fire Clay Refractories — The possibility of producing super-duty fire clay refractories having low porosity, low reheat shrinkage and high under load value from high alumina non-plastic clays, available in abundance in India has been investigated. Fire clay refractories may be used in blast furnaces or glass melting tank furnaces.

It is found that super-duty refractories can be made from high alumina non plastic clays with or without addition of plastic clays if proper forming methods and firing techniques are followed.

CMRS, DHANBAD

Fluid Network Analyser— Messers Bharat Electronics Ltd., Bangalore have constructed a fluid network analyser, as per specifications supplied by the Research Station. The cost of the analyser is found to be nearly a third of that of the imported instrument.

The analyser greatly reduces the time spent on solving network problems of mine ventilation, such as (i) effect of addition of new shafts or airways to the system of mine ventilation; (ii) opening out new seams and closing workings in other seams in mines and their effect on ventilation system; and (iii) installing or removing fans from the ventilation circuit in the mine.

CFTRI, MYSORE

Insect-Proofing of Gunny Bags — An insecticidal formulation and a process for impregnating the gunny bags used for storage of food grains have been developed. The formulation contains lindane+DDT, Dutrex (a petroleum by-product) and groundnut oil in the oil-in-water type emulsion. The fixed oils in the formulation increase the persistence of lindane on treated bag surface.

The process may be used with efficacy for large scale insect-proofing of gunny bags and fabrics.

Sponsored Research

Adsorbed Salts on Textile Fibres—Structure of absorbed inorganic salts on textile fibre has been investigated by X-ray scattering method.

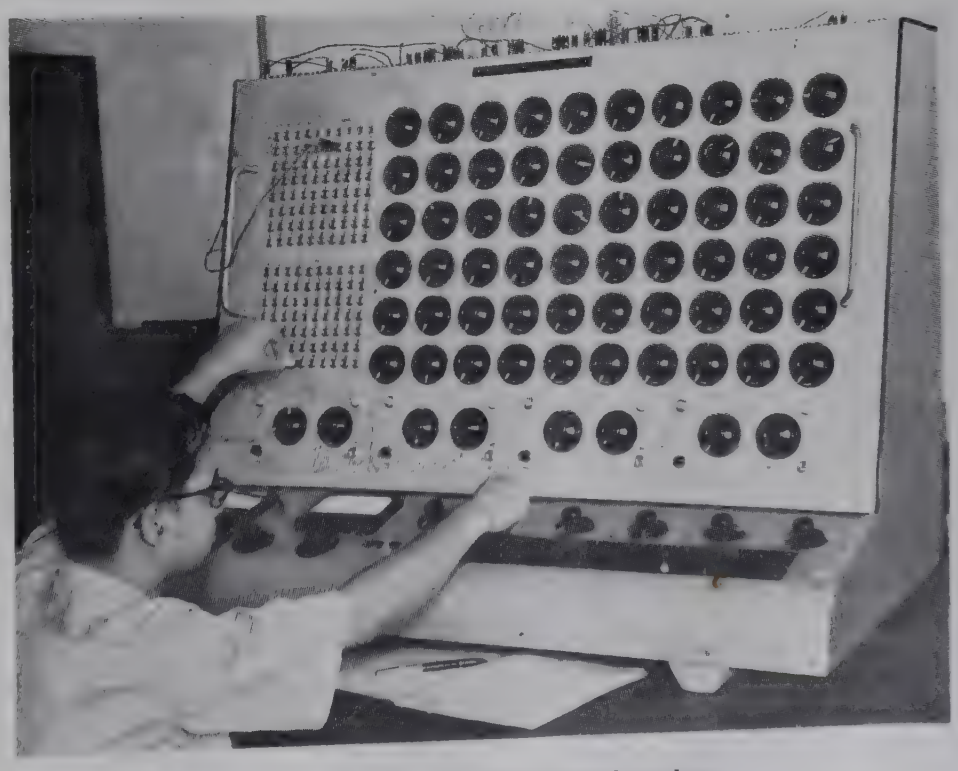
The equatorial small angle X-ray scattering of cotton and viscose fibres containing deposits of silver, mercuric sulphide, lead sulphide, lead iodide and lead chromate has been determined using a special camera constructed for the purpose.

The analysis of the data has shown that inorganic deposits in cotton and viscose fibres possess a wide spectrum of size perpendicular to the fibre axis. The lower limit of size is a few hundred Angstroms while the upper limit is nearly 1000 A.

Studies of the overall scattering pattern, using pinhole collimation, have revealed that in the case of orienting deposits like lead iodide and lead chromate which deposit inside cotton and viscose fibres with preferred orientation of a crystallographic axis parallel to the fibre axis, the size along the direction of orientation is a few times larger than the size perpendicular to the fibre axis. Thus preferred orientation seems to be caused by the elongated shape of the particles—T. RADHAKRISHNAN & G.K. AMBADY, Ahmedabad Textile Industry's Research Association, Ahmedabad.

* * *

The research scheme, *Use of membrane filters* under Prof. S. J. Archivala; Victoria Jubilee Technical Institute, Bombay, has been terminated, w.e.f. June 19, 1961.



CMRS, DHANBAD—Fluid network analyser

Research Papers

Differential thermal analysis in the study of dehydration of magnesium chloride hydrates—W.K. Behl & Harish C. Gaur, University of Delhi, Delhi. *Proc. nat. Inst. Sci. India*, **27** A (1961), 33-37.

Investigations on hydraulic downpull forces on emergency gate under high heads with the help of models—H.L. Uppal, Irrigation and Power Research Institute, Amritsar. *J. cent. Bd. Irrig.*, **18** (1961) 315-24.

The manufacture of supersulphated cement from Indian slag—S.K. Chopra & Kishan Lal, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961), 114-16.

Geometry of thin shells with special reference to hyperbolic paraboloids—G. S. Ramaswamy & M.N. Keshava Rao, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961), 117-21.

Cost analysis of single storey houses—H. V. Mirchandani & Surinder Singh, CBRI, Roorkee. *Indian Build.*, **9** (1961), 32-41.

Shell structures—R. Das Gupta & G.S. Balakrishnan, CBRI, Roorkee. *Cement & Concr.*, **2** (1961), 61-68.

PERSONAL

●DR. BACHITTER SINGH BASSI, Pool Officer, has been appointed Officer-on-Special Duty (Bitumen), CRRI, New Delhi with effect from April 26, 1961.

●SHRI C. R. GUPTA, Project Engineer, NPL, New Dehli has joined CRRI, New Delhi as Officer-on-Special Duty (Incharge Workshop) with effect from May 3, 1961.

●DRS. K. SESHADRI & D.J. MEHTA have been appointed, on promotion, Senior Scientific Officers : Grade I, CSRI, Bhavnagar, with effect from June 2, 1961.

●SHRI IQBAL M.Y. ALVI, has been appointed Structural Engineer Officer, CSIR Secretariat, New Delhi, with effect from May 22, 1961.

●SHRI L.S. MANAVALAN, Junior Scientific Officer, CFTRI, Mysore, has been appointed Senior Scientific Officer : Grade II, NAL, Bangalore, with effect from May 29,1961.

●SHRI V.G. UPADHAYA has been appointed, on promotion, Junior Scientific Officer, CGCRI, Calcutta, with effect from March 7, 1961.

●SHRI M. M. GUPTA has been appointed, on promotion, Junior Scientific Officer, CGCRI, Calcutta, with effect from March 13, 1961.

●SHRI J. V. SHANKAR, Senior Technical Assistant, Publications Directorate, CSIR, New Delhi, has been appointed Junior Scientific Officer, CFTRI, Mysore, with effect from June 15, 1961.

Shri Shankar has been declared eligible for the award of Ph.D. degree in Botany by the Bombay University for his thesis, *Manurial Studies on the Grasslands of Bombay*.

●DR. R. B. HAJELA has been appointed, Junior Scientific Officer, CBRI, Roorkee, with effect from May 24, 1961.

●SHRI S. L. KAPOOR has been appointed, on promotion, Junior Scientific Officer, NBG, Lucknow, effect from May 18, 1961.

●DR. L.A. RAMDAS, Asst. Director, NPL, New Delhi left for Boston on June 26, 1961 to attend the Planning Conference on different aspects of Atmospheric Physics organised by the National Academy of Sciences, U.S.A.

●SHRI S.A. SWAMI, Senior Scientific Officer, CRRI, New Delhi, after completion of his training in Highway Engineering in the University of New South Wales and other institutions in Australia, under Colombo Plan returned and joined duty with effect from June 13, 1961.

●SHRI MOHAN RAI, Junior Scientific Officer, CBRI, Roorkee, after completion of his training in Lime Industry in U.S.A. under Point Four Programme returned and joined duty with effect from April 28, 1961.

PATENTS & PROCESSES

Applications Filed

77061 : *Improvements in or relating to the preparation of polyamide compounds and their compositions as antipriming agents in steam generators*—K.D. Pathak & B.C. Subba Rao, NCL, Poona.

77080 : *A process for the preparation of ambrettoli from aleuritic acid*—S. D. Sabnis, H.H. Mathur & S.C. Bhattacharyya, NCL, Poona.

77223 : *Bed load meter*—H. L. Uppal, I. & P. R. I., Amritsar.

77224 : *Synthetic esters as speciality lubricants for low temperature performance and particularly for the lubrication of clocks and watches*—K.D. Pathak & B. C. Subba Rao, NCL, Poona.

77225 : *A process for the preparation of beta-ionone from pseudoionone*—B. N. Joshi, K. K. Chakravarti, S. C. Bhattacharyya & R.C. Shah, NCL, Poona.

Applications Accepted

68611 : *A device for generating electrical power from the atmosphere*—A.U. Momin, NCL, Poona.

69617 : *A process for the extraction of phenols from coal tar oils and aqueous phenolic liquors*—M. B. Roy, P.K. Banerjee, A.N. Basu & A. Lahiri, CFRI, Jealgora.

69620 : *A process for the production of cellular rubbers and plastics*—R. G. Gokhale & U. Shankar, NCL, Poona.

70318 : *Developments in or relating to the production of oils and fats having materials for detecting their adulteration*—B.S. Joshi, NCL, Poona.

866809(U.K.) : *Improvements in or relating to the preparation of costus root oil and the products thereof*—G. R. Kelkar &. S.C. Bhattacharyya, NCL, Poona.

Application Sealed

67568 : *A process for the preparation of aqueous solution of water insoluble furocoumarins*—J. Misra & B. Mukerji, CDRI, Lucknow.

Process Ready for Exploitation

The Central Food Technological Research Institute, Mysore has developed a process (Indian Pat. No. 52167) for recovering pectin and tartrates from tamarind fruit pulp. The process has been studied on a semi-pilot plant scale and products in good yields (tartrates, 12-13 and pectin, 2.8-3.0 per cent) have been obtained. The pectin, both in liquid and powder form, has been found suitable for preparing fruit jams.

Total capital outlay for a plant capable of producing 310 lb. of Rochelle salt (potassium sodium tartrate) and 50 lb. of pectin per day is estimated at about Rs. 5 lakhs.

Parties interested in taking up the commercial development of the process may correspond with the Secretary, National Research Development Corporation of India, New Delhi.

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R. N. 4212/5

CSIR NEWS

VOL. 11 NEW DELHI—JULY 24, 1961 : SRAVAN 2, 1883 No. 14

MEETING

A meeting of the Executive Council of the Central Road Research Institute, New Delhi will be held at the Institute on Aug. 4, 1961 at 11.30 a.m. Prof. M. S. Thacker, Director-General, Scientific & Industrial Research and Chairman of the Executive Council, will preside.

Symposium on Carbohydrate, Cellulose and Cellulose Industries

The Chemical Research Committee of the CSIR is sponsoring a symposium on 'Carbohydrate, Cellulose and Cellulose Industries' at the Ahmedabad Textile Industry's Research Association, Ahmedabad during January 1962. Papers on the following aspects will be presented and discussed at the symposium :

(1) Chemistry and biosynthesis of carbohydrates

(2) Physics and chemistry of natural cellulose fibres

(3) Chemistry and technology of cellulose fibres, papers and rayon pulp and cellulose derivatives

Further details regarding the symposium can be obtained from the Director, Ahmedabad Textile Industry's Research Association, Ahmedabad-9.

PERSONAL

●SARVASHRI S. RANGANATHAN, SANTOSH KUMAR BANERJEE, K. D. MAJI, A.K. LAHIRI, R.D. GUPTA and R.K. DUBEY have been appointed, on promotion, Senior Scientific Officers : Grade II, NML, Jamshedpur, with effect from June 1, 1961.

●DR. M.L. BERI, Junior Scientific Officer, CFRI, Jealgora, has been appointed Senior Scientific Officer : Grade II, Regional Coal Survey Station, Jammu, with effect from June 19, 1961.

●SARVASHRI G.W. KAPSE and D.R. NARHARI have been appointed, on promotion, Senior Scientific Officers: Grade II, CBRI, Roorkee, with effect from June 22, 1961.

●SARVASHRI B.K. GUHA, M.K. GUPTA, P.K. SOM and NARINDER SINGH have been appointed, on promotion, Junior Scientific Officers, NML,Jamshedpur, with effect from June 1, 1961.

●SHRI V. SITAKARA RAO has been appointed, on promotion, Junior Scientific Officer, CSRI, Bhavnagar, with effect from June 2, 1961.

●SHRI S.S. REHSI has been appointed, on promotion, Junior Scientific Officer, CBRI, Roorkee with effect from June 27, 1961.

●SHRI P.S. DESIKAN has been appointed, on promotion, Junior Scientific Officer, CECRI, Karaikudi, with effect from July 1, 1961.

●SHRI CHINTAMANI SHARMA has been appointed Personal Assistant (Tech.) to the Director, NML, Jamshedpur, with effect from June 7, 1961.

●SHRI K.V.N. RAO has joined CECRI, Karaikudi, as Pool Officer, with effect from June 30, 1961.

●DR. C.K. RAMESH, Senior Scientific Officer : Grade I, CBRI, Roorkee, has been transferred to RRL, Assam, with effect from May 20, 1961.

●SHRI J.B. SAHA, Civil Engineer, CMERI, Durgapur, relinquished charge of his post with effect from April 6, 1961.

●SHRI K S. LAKSHMINARAYANAN, Junior Scientific Officer, CMERI, Durgapur, relinquished charge of his post with effect from May 31, 1961.

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●SHRI JATINDER MOHAN, Senior Scientific Officer, NML, Jamshedpur, who had been to Yugoslavia for one-year training in Foundry Technology under Yugoslav Government Scholarship Scheme returned to India and resumed duty with effect from June 3, 1961.

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●SHRI V. CADAMBE, Director, CMERI, Durgapur, has been appointed by the Government of India a member of the Development Council for scheduled industries engaged in the manufacture of machine tools for a period of 2 years with effect from May 6, 1961.

●DR. S. HUSAIN ZAHEER, Director, RRL, Hyderabad, has been nominated a member of the Board of Gujarat State Fertilizer Project.

●PROF. S.R. MEHRA, Director, CRRI, New Delhi, has been nominated a member of the Organising Committee constituted by the Ministry of Transport & Communication for the 12th Session of the Permanent International Association of Road Congress to be held at New Delhi in 1963.

●DR D.S. BHATIA, Asst. Director, CFTRI, Mysore, has been nominated a member of the Committee constituted by the Government of Kerala to chalk out programme for further expansion and development of activities of the Fisheries Technological Station, Kozhikode.

●SHRI J.C. BANERJEE, Asst. Director, CGCRI, Calcutta, has been nominated Chairman of the Man Power Sub-Committee of the Panel on Refractories, Ministry of Commerce & Industry.

●SHRI PREM PRAKASH, Asst. Director, NPL, New Delhi, has been nominated a member of the Committee on Book Selection, Translation and Publication of General Books into Hindi, constituted by the Ministry of Education (Central Hindi Directorate).

●SHRI G. D. JOGLEKAR, Asst. Director, NPL, New Delhi, has been nominated Chairman of the Secondary Cells and Batteries Sectional Committee, Indian Standards Institution.

●DR. H.S.R. DESIKACHAR, Senior Scientific Officer, CFTRI, Mysore, has been nominated member of the Cereals and Pulses Sectional Committee, Indian Standards Institution.

●The following officers have been nominated members of the various technical committees of the Indian Standards Institution :

●SHRI PREM PRAKASH, Asst. Director, NPL, New Delhi—*Sieves Sectional Committee* and *Laboratory Glassware and Related Apparatus Sectional Committee.*

(*Contd. on p. 2, col. 3*)

BRIEFS

SUNFED Aid for NAL

Mr. W. Weissel, Chief Engineer, United Nations Special Fund Projects, UN Headquarters and Mr. David Blickenstaff of the UNTAB, New Delhi, visited the National Aeronautical Laboratory (NAL), Bangalore on June 22, 1961 in connection with the programme of technical assistance to NAL from the UN Special Fund (SUNFED). The Fund has sanctioned assistance of $ 1.5 million to the Laboratory.

Dr. P. Nilakantan

Dr. P. Nilakantan, Director, NAL, Bangalore left for Amsterdam on July 15, 1961 for attending the meeting of the Advisory Panel of the UN Special Fund in connection with the assistance to NAL.

Dr. Nilakantan will also visit Stockholm and London to study the latest developments and facilities available for aeronautical research in Sweden and U.K.

NAL Windmill for Ethiopia

One WP-2 type windmill (complete with tower) designed and developed at the National Aeronautical Laboratory, Bangalore will be supplied, free of cost to the Imperial Ethiopian College of Agriculture & Mechanical Arts, Ethiopia. The offer has been made as the Department of Agricultural Engineering of the College evinced interest in adopting the design of NAL windmills in highland areas of Ethiopia.

CPHERI, Nagpur

Achievements of the Institute were displayed through suitable exhibits, including working models and practical demonstration of processes at the All-India Exhibition, Bharat Bhagyodaya Pradarshani, held at Nagpur during May 6 to June 6, 1961.

Research Fellowships

The following have been awarded *CSIR Fellowships* for research in schemes noted against their names:

Senior Fellowships :

1. SHRI R. VAIDYANADHAN—*Physico-chemical processes in some sedimentary environment on the East coast of India* (Andhra University, Waltair).

2. SHRI ARUN KUMAR SEN—*Studies on enhanced solar radio emission at two harmonically related frequencies, etc.* (Institute of Radiophysics & Electronics, Calcutta).

Junior Fellowships :

1. SHRI OM PARKASH—*Influence of ultrasonics on colloidal systems* (University of Allahabad, Allahabad).

2. SHRI N.Y. DAS—*Botanical exploration of Tungar Hill Thana District, Bombay State* (St. Xavier's College, Bombay).

3. SHRI RABINDRANARAYAN MUKHERJEE—*Chemical investigation of Indian medicinal plants, etc.* (University College of Science & Technology, Calcutta).

4. SHRI DEEPAK BASU—*Studies on enhanced solar radio emission at two harmonically related frequencies, etc.* (Institute of Radiophysics & Electronics, Calcutta).

5. SHRI ARUN UDAY DE—*Synthesis of indanepyrroles, indanepyrrolidines, indenothiazoles and indenoiminazoles* (University College of Science & Technology, Calcutta).

6 & 7. SARVASHRI R. M. P. JAISWAL & C.P.D. DWIVEDI—*Emission and absorption spectra of simple molecules* (Gorakhpur University, Gorakhpur).

8. SHRI ANAND PERKASH—*Study of diffuse X-ray reflection and determination of elastic constants of crystals* (Indian Association for the Cultivation of Science, Calcutta).

9. SHRI S.K. MUKHERJEE—*Studies on the ionization and fragmentation of molecules, etc.* (Presidency College, Calcutta).

10. SHRI S.D. SHARMA—*Studies of dislocations in relation to some structure-sensitive characteristics of crystals* (Punjab Engineering College, Chandigarh).

Research Schemes Terminated

The following schemes have been terminated :

1. *Pharmacological studies on a new tubercular antibiotic*—Dr. (Mrs) S. Chandrasekher, Vallabhbhai Patel Chest Institute, University of Delhi, Delhi (June 30, 1961).

2 & 3. *Investigation of the quantitative significance of growth of plankton in relation to water quality*; *Investigation on the significance and value of various biological indices in the pollution of water*—Shri H.L. Sarkar, University of Delhi, Delhi (June 30, 1961).

PERSONAL

(*Contd. from p. 1, col. 3*)

SHRI M.R. VERMA, Senior Scientific Officer, NPL, New Delhi—*Sugar Industry Sectional Committee.*

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●DR. A.P. MITRA, Asst. Director, NPL, New Delhi, has been elected a member of the American Geophysical Union. He has also been elected an Ordinary Fellow of the National Institute of Sciences.

●DR. H.L. UPPAL, Asst. Director, CRRI, New Delhi, has been elected a member of the Executive Committee of the Indian National Society of Soil Mechanics and Foundation Engineering.

* * *

●SHRI PRATAP SINGH, Senior Scientific Assistant, NBG, Lucknow, has been awarded the degree of Candidate of Biological Sciences by the Moscow State University for his thesis, *Medicinal Species of* Digitalis *of U.S.S.R.—Their Pharmacognosy and Cultivation.*

●SHRI M. R. GOPALAN, Junior Research Fellow, CSIR scheme, Kinetics of polymerization with special reference to elucidation and experimental confirmation of the actual role of solvent in free radical polymerization (Investigator - in-charge : Dr. M. Santappa, University of Madras, Madras) has been declared qualified for the Ph.D. degree by the University of Madras.

Shri N.K.D. Choudhury

Shri N.K.D. Choudhury has been appointed Assistant Director, CBRI, Roorkee, with effect from July 12. 1961.

Shri Choudhury (*b.* February 1922) after obtaining his B.Sc. (Hons) and M.Sc. degrees in Physics in first class from the University of Calcutta, proceeded for advanced studies to U.S.A. under a Government Scholarship. In 1948, he got his M.S. degree (first grade) from the Montana State University, U.S.A.

On his return to India, he joined the All India Radio and worked in the Planning & Development and Research Department of the AIR. Before taking assignment under CSIR he was Assistant Research Engineer, in charge of the Acoustics Section of the Research Department. He has published a number of research papers in acoustics and electronics.

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Dolomites for Sintering in Shaft Kilns—Comprehensive laboratory studies on the sintering of dolomite in shaft kiln has been carried out at the instance of *Hindustan Steel Ltd.*, Rourkela. Samples for the study were collected from different pits of Hirri and Hardi mines near Rourkela and from Baraduar in Madhya Pradesh.

Dolomite from Hirri mines, in which the distribution of silica is not uniform, does not appear to be suitable for sintering in shaft kiln unless selective mining is resorted to or some suitable means of separating the high silica dolomite is adopted. The Hardi dolomite yields very good sinter and is free from the heavy dusting observed in the case of Hirri samples, but it has a slight tendency to stick inside the shaft at high temperature in the range of 1620—1720°C. or above. The sinter obtained from Baraduar dolomite is free from dusting and sticking and hence appears to be the best of the three samples. However, on firing to 1650°C. it does not yield as dense a sinter as the Hardi dolomite and consequently a higher firing temperature is needed to get equally good sinter.

CGCRI, CALCUTTA

Glass Bonded Mica—Optimum conditions for the production of glass bonded mica—used for electrical insulation purposes—have been worked out using suitable glass composition developed at the Institute. Electrical properties of these insulating bodies are comparable to those of imported products.

CECRI, KARAIKUDI

Preparation of Electrolytic Bromates—Use of lead dioxide deposited graphite or carbon anode has been found to be better than the conventional graphite anode in the electrolytic preparation of bromate from bromide.

Lead dioxide deposited anode can stand high current density (20 amp./dm.^{2}) and high temperature (60-70°C.) of electrolysis which permits greater build-up of bromate in the electrolyte. Using the anode, sodium bromate and potassium bromate have been prepared with 90-95 per cent current efficiency; energy consumption per kg. of salts is 4.14 and 4.46 kWh respectively. The product is purer than that obtained with graphite anode and requires simpler purification technique—S. SUNDARAJA, K.C. NARASIMHAN & H.V.K. UDUPA.

CFTRI, MYSORE

Pre-harvest Treatment for Infestation Control—Investigations carried out in the laboratory have shown that spraying of paddy and *jawar* prior to harvest with a low dosage of malathion (8 p.p.m.) could replace the costly process of fumigation for infestation control of stored grains in rural areas.

CRRI, NEW DELHI

Road Binders from Low Temperature Tar Pitch—Two processes for the preparation of road binders utilizing low-temperature tar (500-700°C) pitch have been developed. Laboratory experiments indicate that these binders compare favourably with conventional products.

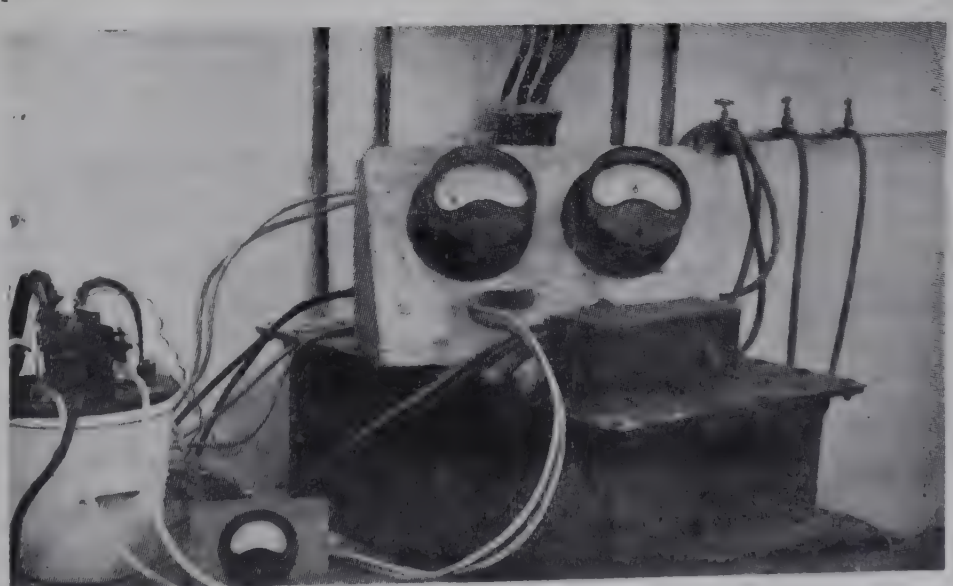
In the first process a pitch of soft-medium consistency is blended with high temperature tar oils of high boiling ranges. In the second process a soft pitch is blended with a hard straight-run bitumen and the mixture fluxed back with high temperature tar oils. The high temperature tar oils like anthracene or heavy creosote oil bring down the pitch to the consistencies of standard binders and also enhance their durability.

A test track has been laid down recently (2-3 months ago) on the Delhi-Mathura Road for finding out the suitability of the binders for road construction. Till now the road surfaces (both surface dressing and premix) are standing the traffic satisfactorily.

Sponsored Research

Rain and Cloud Research—Studies on the cloud droplet growth to the stage of rain, precipitation features of clouds in different seasons, and cloud seeding have been in progress. Some of the results of these studies were reported in earlier issue (*CSIR News*, Vol. 9, No. 21, p. 3).

Further studies using high power meteorological radar have yielded valuable information in regard to certain distinguishing features of rain processes in clouds in and around Delhi. Based on observation of frequency of occurrence of rain cells of different types, classified according to their vertical structure, areal coverage, average life and associated mean precipitation rate, the relative contributions to a season's total rainfall in the area by 'warm' and 'cold' rain have been estimated. It is observed that, while frequency of warm rain occurrence during monsoon season is often more than 45 per cent, the net yield of rainfall rarely exceeds 2 per cent of the total.



CECRI, KARAIKUDI—Set-up for the electrolytic preparation of bromates using lead dioxide anode

Echo intensity structures associated with precipitation cells at various stages of their development have been systematically determined by suitably calibrating radar A-scope. Tentative results indicate that (i) rise or fall in precipitation rate at each level within a cumuliform cloud follows closely the rise or fall of the radar cloud top, and (ii) echo intensity measurements in successive convective cells, arranged in a squall line formation, show high and low precipitation rates being associated with alternate cells. Observed intensity gradients just above and below melting band, in situations of widespread rain from cold layer type clouds have shown features suggestive of important differences with those observed in temperate latitudes. In particular, the measurements appear to indicate that frozen precipitation elements in upper cold layers in such clouds during monsoon season are more frequently in the nature of hail or high density ice, rather than snow flakes as in temperate regions.

Rain stimulation experiments, by salt seeding techniques from ground conducted at Delhi for the fourth monsoon season have yielded encouraging results. To help arrive at a speedy conclusion, similar seeding trials have been arranged at Jaipur and Agra.

Day to day variations in nuclei concentration (giant hygroscopic and freezing nuclei), chloride content of rain water, evolution of cloud droplet spectrum and of raindrop size distributions, are among other important aspects of studies being pursued.—A.K. Roy, Rain & Cloud Physics Research Unit, NPL, New Delhi.

Heat-resistance in Bacterial Spores—Effect of different elements namely, zinc, manganese, magnesium, potassium and iron on the germination of *Bacillus subtilis* spores and the growth, sporulation and heat-resistance of the resulting spores has been studied using a synthetic media.

Sporulation does not take place in absence of magnesium ; germination is also slow. Thin heat-labile cells appear after an incubation period of one week at 37°C. The rate of growth is retarded in the absence of zinc, and considerable lowering of heat-resistance of spores is observed. Iron is helpful for rapid sporulation and for heat-resistance of spore.

Different nitrogen sources for the germination, growth and sporulation of *B. subtilis* cells have been investigated. Glucose, glutamic acid, asparagine, arginine and proline induce germination and sporulation. Valine and cysteine induce germination and support growth but do not induce sporulation. Heat-resistance of spores grown in media containing asparagine is more than that of spores grown in media containing proline or arginine.

Of the different carbon sources examined (glucose, fructose, sucrose, arabinose, maltose, lactose, galactose and starch) glucose has been found to be the best and starch the poorest—A.N. Bose & A.K. Chattopadhyay, Jadavpur University, Calcutta.

Research Papers

Optical absorption spectra of solarized Mn^{3+} and V^{2+} ion in glass—S. Kumar & Purabi Sen, CGCRI, Calcutta. *Phys. chem. Glass.*, **1** (1960), 175-80.

Effect of mica additions in exterior house paints—S.B. Roy & H.D. Sarkar, CGCRI, Calcutta. *Paint-india*, Ann. No. 1960, 139-44.

Sintered lightweight aggregate from Indian fly ashes—S.K. Chopra & Kishan Lal, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961), 150-53.

The membrane theory applied to hyperbolic paraboloid shells—G.S. Ramaswamy & M.N. Keshava Rao, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961), 156-62 & 168-71.

PATENTS & PROCESSES

Applications Filed

77449 : *A new surgical suturing instrument*—A. P. Jayaraj, CFTRI, Mysore.

77450 : *New heterocyclic compounds of pharmacological interest*—P. B. Sattur, G.S. Sidhu, S. J. Hasan & S.H. Zaheer, RRL, Hyderabad.

77451 : *Improvements in or relating to the production* of *terpineol*—Bharat Bhushan, N. K. Sogani & S.H. Zaheer,RRL, Hyderabad.

77452 : *Improvements in or relating to the production of terpin hydrate*—Bharat Bhushan, N.K. Sogani & S.H. Zaheer, RRL, Hyderabad.

77453 : *N. (Alkylaminoalkyl)-2-phenylethylamines* — P. B. Sattur, G. S. Sidhu, S. J. Hasan & S. H. Zaheer, RRL, Hyderabad.

Process Ready for Exploitation

The National Metallurgical Laboratory, Jamshedpur has developed improved processes for hot-dip aluminising of ferrous material using molten flux, aqueous flux and linseed oil flux. The processes are covered by Indian Patents Nos. 55289, 57938 and 65230. Aluminised steel can beneficially replace galvanised steel sheet, strip, wire, tube, hardware, etc.

Steel wire aluminised by the above processes has been tested by the British Iron & Steel Research Association, U.K. and found satisfactory in performance. Aluminised wire and hardware are also being tested by the Post & Telegraphs Department for use in telephone lines.

The cost of processing of 10 SWG steel wire using aqueous flux has been estimated to be about Rs. 265 per ton when produced on a pilot plant scale.

Parties interested in taking up the commercial development of the process may write for full details to the Secretary, National Research Development Corporation, Mandi House, New Delhi.

Process Leased Out

The process for the manufacture of *Rubber Base Contact Adhesive* (Indian Pat. No. 65977) developed by the National Chemical Laboratory, Poona has been leased for exploitation to the following concerns : (1) K.N. Chari & Co., Madras ; (2) Saru Smelting & Refining Corporation Ltd., Meerut ; (3) Pragati Commercial Corporation Private Ltd., Bombay ; (4) Manchester Commercial Corporation, Bombay ; (5) Gungadhur Banerjee & Co. Private Ltd., Calcutta ; (6) Adhesive Tapes Private Limited, Bombay ; (7) Plumuth Corporation, Delhi ; and (8) Rambilas Shivkaram, Poona.

* * *

The process for the preparation of *Water Dispersible DDT as an Oil Bound Paste* (Indian Pat. No. 56726) developed by the National Chemical Laboratory, Poona has been leased out for exploitation to South India Research Institute (P). Limited, Vijayawada.

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CSIR NEWS

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MEETINGS OF EXECUTIVE COUNCILS AND RESEARCH COMMITTEES

Executive Councils of National Laboratories

CIMPO, New Delhi	Aug. 17, 1961	CSIR Secretariat, New Delhi, 11.30 a.m.
CMRS, Dhanbad	Aug. 21, 1961	CMRS, Dhanbad, 9.30 a.m.
RRL, Hyderabad	Aug. 24, 1961	RRL, Hyderabad, 3.00 p.m.
NCL, Poona	Aug. 26, 1961	NCL, Poona, 9.30 a.m.
CECRI, Karaikudi	Aug. 26, 1961	CECRI, Karaikudi, 10.00 a.m.
CFTRI, Mysore	Aug. 29, 1961	Chambers of the Chief Minister of Mysore, Bangalore, 5.00 p.m.

Research Committee

Biological Research Committee	Aug. 29, 1961	CSIR Secretariat, New Delhi, 10.00 a.m.

PERSONAL

●DR. R.K. SRIVASTAVA has been appointed, on promotion, Information and Liaison Officer, CFRI, Jealgora, with effect from July 10, 1961.

●DR. C.P. AGARWAL, Senior Technical Assistant, has been appointed to officiate as Scientific Reporter, Publications Directorate, CSIR, New Delhi, with effect from July 7, 1961 *vice* Shri Y.R. Chadha, on deputation abroad.

●SHRI H.N. VENKOBA RAO has been appointed, on promotion, Junior Scientific Officer, CECRI, Karaikudi, with effect from July 12, 1961.

●SHRI A.V. RAO has been appointed Junior Scientific Officer, CSRI, Bhavnagar, with effect from July 13, 1961.

●SHRI A. K. DATE has been appointed Junior Technical Officer, BITM, Calcutta, with effect from June 27, 1961.

●SHRI P.H. GUPTA has been appointed Civil Engineer, CMERI, Durgapur, with effect from July 22, 1961.

* * *

●SHRI K.G. KRISHNAMURTHI, Technical Secretary, CSIR, New Delhi, after completion of his 5-week tour of France and U.K. returned to India and resumed duty with effect from July 22, 1961. In France, he visited a number of research laboratories and discussed projects of mutual interest with Government officials. In U.K., he visited some of the DSIR establishments and research associations and discussed problems relating to planning, organisation and execution of research programmes with officials of the DSIR.

●DR. L.A. RAMDAS, Asst. Director, NPL, New Delhi, returned from U.S.A. on July 25, 1961 after attending the Planning Conference on Atmospheric Sciences at the invitation of the National Academy of Sciences, U.S.A. The conference of leading meteorologists held at Boston (June 28 to July 19, 1961) recommended goals and outlined integrated 10-year National Plan in Bio-Meteorology, Atmospheric Physics & Chemistry, Atmospheric Dynamics, Atmospheric Structures & Circulations and Engineering Meteorology.

●SHRI S. GHOSH, Senior Scientific Officer, CECRI, Karaikudi, who had been to France for training in Storage Battery Technology under the French Government Scholarship returned and resumed duty with effect from July 19, 1961.

Prof. M.S. Thacker

Professor M.S. Thacker, Secretary to the Government of India and Educational Adviser (Technical), Ministry of Scientific Research & Cultural Affairs and Director-General, Council of Scientific & Industrial Research, will leave New Delhi on August 19, 1961 for a six weeks' tour of Europe and USSR. He is specially invited to attend the United Nations Conference on 'New Sources of Energy' which is meeting at Rome from August 21 to 31. He is the Chairman of the Plenary Session of the Conference on Wind Energy. From September 1 to 15, he will be in London in connection with the Commonwealth Scientific Committee of which he is the Chairman. From September 15 to October 1, Professor Thacker will be at Moscow at the invitation, and as the guest, of the Academy of Sciences, USSR. He is expected to return to Delhi on October 2, 1961.

* * *

Prof. M.S. Thacker has been nominated a member of (i) General Committee (ii) Annual Meeting of the *Indian Parliamentary and Scientific Committee* by the National Institute of Sciences of India.

●SHRI T.R. SEHGAL, Junior Scientific Officer, CRRI, New Delhi, after completion of his training in Advanced Statistics as applied to Road Traffic Problems at the Imperial College of Science and Technology and the Road Research Laboratory, U. K. under the Colombo Plan returned and resumed duty with effect from July 22, 1961.

●DR. ARUN K. DEY of the University of Allahabad and Investigator-in-charge of the CSIR schemes left New Delhi on July 19, 1961 for participating in XVIII International Congress of Pure and Applied Chemistry (Montreal), Sixth International Conference on Coordination Chemistry (Detroit, Michigan) and International Symposium on Microchemical Techniques (Pennsylvania). He will visit vario

(Contd. on)

BRIEFS

Burmah Shell Research Fellowships

A new fellowship scheme has been added to the fellowships and scholarships schemes administered by the Council of Scientific & Industrial Research. The scheme, instituted by Burmah-Shell Oil Storage and Distributing Company of India Ltd., replaces their Loughborough Scholarships Scheme instituted in 1952.

The object of the scheme is to provide assistance to research students to prepare for a Doctorate Degree. The fellowships are tenable at the following institutions: (1) Indian Institute of Science, Bangalore; (2) Indian Institute of Technology, Kharagpur; (3) Indian Institute of Technology, Bombay; (4) Indian Institute of Technology, Madras; (5) Indian Institute of Technology, Kanpur; and (6) University of Roorkee, Roorkee.

Candidates who hold a Master's Degree in any branch of engineering or technology and are under 27 years of age on Sept. 1, 1961 are eligible for the award for this year. The value of the Fellowship is Rs. 500 per month. The tenure of Fellowship will ordinarily be two years which may be further extended in special cases.

CGCRI Achievements Reviewed

Prof. W. E. S. Turner, F. R. S, Department of Glass Technology, Sheffield, has commended the work of the Central Glass & Ceramic Research Institute, Calcutta in an article published in *Glass Technology* (Vol. 2, No. 2, April 1961) as follows: "This Research Institute has achieved an outstanding reputation for the quality and variety of its work amongst the industrial research institutes established by the Government of India. Its annual reports for several years past have disclosed activities in various field of glass and of ceramics, which have greatly stimulated these industries."

Special mention has been made in the article of the success achieved by the Institute in the production of optical glass, development of laboratory porcelain, and surveys of sands for glass making and Indian clays for refractory materials.

Research Fellowships

The following have been awarded CSIR Fellowships for research on projects noted against their names:

Senior Fellowships:

1. Shri R. D. Mehta—*Reaction of dimethylolurea with cotton cellulose* (Ahmedabad Textile Industry's Research Association, Ahmedabad).
2. Shri J. R. Modi—*Studies on the chlorine retention of resin-treated cellulosic fibres* (Ahmedabad Textile Industry's Research Association, Ahmedabad).
3. Shri Amiya Kumar Bandyopadyaya—*A study of the metabolism of some amino acids and related enzymes system* (University College of Science & Technology, Calcutta).

Junior Fellowships:

1. Shri S.R. Prashad—*Reaction in the liquid phase* (Physical Chemistry Laboratory, Bihar University, Muzaffarpur).
2. Shri Arya Kumar Mukherjee—*New synthesis of unsaturated macrocyclic compounds* (Presidency College, Calcutta).
3. Shri J.C. Pant—*Shock waves in fluid dynamics and magneto-hydrodynamics* (University of Gorakhpur, Gorakhpur).
4. Miss Sarla R. Modi—*Biosynthesis of coenzymes neucleotide* (Indian Institute of Science, Bangalore).
5. Shri R. M. Srivastava—*Chemical investigation of alkaloids from* Cissampelos pareira *and attempts to elucidate the chemical structure of the isolated alkaloids* (Lucknow University, Lucknow).

PERSONAL

(*Contd. from p. 1, col. 3*)

universities and laboratories in U.K. and deliver lectures at research institutions in U.S.A., U.K., Canada and Japan.

* * *

●Dr. V. Subrahmanyan, Director, CFTRI, Mysore, has been nominated Chairman of the Soft Drinks Sectional Committee, Indian Standards Institution.

●Dr. B. Mukerji, Director, CDRI, Lucknow, has been nominated a member of the (i) General Committee and (ii) Annual Meeting of the Indian Parliamentary and Scientific Committee by the National Institute of Sciences of India.

●The following officers of the NPL, New Delhi have been nominated member/chairman of the various sectional committees of the Indian Standards Institution.

Shri G.D. Joglekar, Asst. Director (*Chairman*)— *Electrotechnical Standards.*

Dr. M. Pancholy, Asst. Director (*Chairman*) — *Acoustics.*

Shri T. V. Ramamurti, Senior Scientific officer (*Chairman*) —*Electronic Components.*

Shri R.K. Tandan, Senior Scientific Officer (*Principal Member*) and Shri K.S. Sharma, Junior Scientific Officer (*Alternate Member*)— *Electric Lamps and Accessories.*

Shri M.V. Joshi, Senior Scientific Officer (*Member*)—*Electronic Equipment.*

* * *

●Dr. (Smt) Archana Sharma, Senior Research Fellow, CSIR scheme, Study of cellular factors controlling sensitivity of plant chromosomes with X-rays and chemical agencies (Investigator-in-charge: Dr. A.K. Sharma, Calcutta University, Calcutta), has been admitted to the D. Sc. degree of the Calcutta University for her work in the scheme.

●Shri Upendra Ch. Bhattacharyya, Junior Scientific Assistant, CSIR scheme, Comparison of the chemistry of normal chromosomes with those of malignant cells (Investigator-in-charge: Dr. A.K. Sharma, Calcutta University, Calcutta) has been admitted to the D. Phil. degree of the Calcutta University for his work in the scheme.

Shri K. G. Katwey

Shri K. G. Katwey has been appointed Asst. Director, NAL, Bangalore, with effect from June 23, 1961.

Shri Katwey (*b.* Hubli, Nov. 21, 1912), a graduate in civil engineering from the University College of Engineering, Bangalore (1934) has about 25 years' experience in varied types of construction work and projects. As a Superintending Engineer, Sharavati Valley Project, he was associated with the design and quality control work. He worked in the Hindustan Aircraft Ltd., Bangalore for six years as Chief of Factory Planning Department and Chief Civil Engineering Designer and was responsible for planning and designing of most of the important structures related to the aircraft, the railcoach and the aero-engine factories.

Obituary

We regret to record the sudden demise, due to heart failure, of Shri R. J. Sujir, Senior Scientific Officer, RRL, Hyderabad on July 14, 1961.

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Silicate Bonding—Effect of partial or total replacement of carbon dioxide by other gases (oxygen, nitrogen and air) on the hardening characteristics of silicate bonded sands in the preparation of moulds and cores has been studied and the properties of the product compared with those of regular dried oil sand cores. The study has shown that dilution of carbon dioxide by air, oxygen or nitrogen lowers the strength of the sand mixtures. When air or oxygen is used alone, the sand mix does not develop any strength at all. In the hardening of silicate bonded sand by the application of heat alone, the binder requirement is more as compared to hardening by carbon dioxide or a mixture of carbon dioxide with other gases. The strength values obtainable with silicate bonded and dried specimens are higher than in the case of dried oil sand specimens. Addition of sucrose along with sodium silicate imparts higher compressive strength to the specimens.

Development of Clad Metals—Zinc-free aluminium-base bearing alloy compositions have been developed using lead and antimony in various proportions. The alloys possess good wear, friction and mechanical properties. These have been successfully bonded to steel backing by cold and hot-rolling of the packs. Evaluation of other properties of the bonded metal is in progress.

CFRI, JEALGORA

Coke for Calcium Carbide—Studies carried out at the Institute have shown that hard coke with very low ash and low phosphorus content required for manufacturing calcium carbide can be prepared from washed Giridih coal.

The process adopted is as follows: A coal sample from the lower Kurhurbaree seam, Giridih, was wahsed in the heavy medium pilot wahsery. The clean coal (ash 7.3 and yield 63.7 per cent) was crushed to a size of 85 per cent through 3 mm. and carbonized in the Institute's pilot coke plant at an average flue temperature of 1250°C., yielding a coke of about 10 per cent ash and below 0 03 per cent phosphorus. The coke, when tested in carbide factory of Messrs. Birla Jute Mfg. Company at Birlapur (W. Bengal), yielded suitable calcium carbide—N.N. Das Gupta, S.K. Sharma, S.K. Sen Gupta, N.N. Chaterjee & A. Lahiri

CFTRI, MYSORE

Studies on Garlic—The precursor of the active principle and the enzyme allinase of garlic have been obtained in dry form. A mixture of these two components has been found effective in the treatment of rheumatism, flatulence, dyspepsia and bacillary dysentery.

CDRI, LUCKNOW

Preparation of Properdin—Fractionation of bovine serum has been attempted to work out a large scale method for the preparation of properdin. Using buffalo serum, pure properdin has been obtained adopting an entirely new procedure. Conditions have also been standardised for the clinical assay of properdin in human sera.

Properdin—a nonspecific bacterial factor—is used in proxymal nocturnal haemoglobinurea, anaphylactic shocks and hazards arising out of exposure to radiations.

CNS Stimulants—Substituted phenylpropanols and propionates are being studied for their stimulating effect on central nervous system (CNS). Of the compounds tested so far, 2-piperidyl-(1)-3-phenylpropanol has been found to increase the physical and mental activity.

CRRI, NEW DELHI

Creep Strength of Clays—Ultimate shearing resistance of clays is conventionally taken as an index for ensuring the stability of fills on marsh and other soft clays. Laboratory studies carried out at the Institute have shown that it is unsafe to rely merely on the ultimate shearing resistance and that the ratio of creep strength to ultimate shearing resistance is an important factor in assessing the stability of abutments and retaining walls against progressive lateral movement and of the subsidence of highway fills on soft ground.

The ratio of creep strength to ultimate shearing resistance of many Indian clays has been determined. The values have been found to vary from 0.4 to 0.95 depending on the nature of clays.

Data have been collected to indicate that low creep strength of soils could be responsible for the subsidence and gradual failures of highway embankments resting on soft cays.

CSRI, BHAVNAGAR

Algae Research—An examination of the collection of algae on the sea coast at Gopnath, near Bhavnagar, has revealed the existence of a new species of *Polysiphonia*, not so far described in literature. A complete morphological study of the species has been carried out.

CEERI, PILANI

Amplifier for Analogue Computer—A prototype operational d.c. amplifier suitable for use in an analogue computer has been developed and constructed using vacuum tubes. The circuit uses standard techniques, such as chopper stabilisation for automatic drift correction, shaped frequency response for adequate gain and phase margins, and minimum input stage grid current by choosing an appropriate operating point. The preliminary specifications for the circuit have been drawn.

RRL, HYDERABAD

Artificial Insemination in Cockroach—Studies have been in progress on the artificial insemination in cockroach with a view to investigate the biological effect of different radiations on the spermatozoa of insects in *in vitro* condition.

A technique for artificial insemination of cockroach has been developed and a detailed study of the reproductive systems of the male and female cockroach and its accessory parts has been carried out.

An apparatus to artificially inseminate cockroach has been set up. Preliminary trials show that the number of spermatozoa able to reach the spermatheca using the apparatus is 30 per cent of that under natural insemination. Work is in progress to increase the percentage of spermatozoa reaching spermatheca—A.K. Jaiswal & M.D. Naidu.

Sponsored Research

Malignant Plant Cells—Chemical studies on the normal and malignant cells of different members of *Liliaceae*, including *Allium cepa* and *Allium sativum* have been carried out.

Tumors were induced in the plant roots by applying suitable alkaloids and hormones. Alkaloid-induced tumors contained enlarged cells with rare divisional figures, while those induced by hormone lost their cell polarity and suffered atrophy of cell size and had divisional figures showing irregularities.

Chemical changes were studied in the tumor cells and the meristematic cells adjoining the tumors. Alkaline and acid phosphatse activity in chromosomes was very high during malignancy. Cytoplasm, in the normal cells did not show much difference to that in malignant cells particularly in plant with alkaloid-induced tumors. Ribonucleic acid reaction both in the chromosome and cytoplasm was much heavier than that of the normal cells. There was no marked difference in the desoxyribonucleic acid of both type of cells. Basic protein synthesis in the cytoplasm was much higher than that of non-basic protein during malignancy as compared to control; in general the overall protein synthesis and arginine content in the cytoplasm was heavy. Both the nucleic acid and protein test showed that in the case of plant tumors ribonucleoprotein synthesis is heavy during malignancy—A.K. SHARMA & U.C. BHATTACHARYYA, University College of Science, Calcutta.

Research Papers

Colouring of vanaspati with curcumin from turmeric—P.O. Kapur, M. Srinivasan & V. Subrahmanyan, CFTRI, Mysore, *Curr. Sci.*, **29** (1960), 250.

Gray-King carbonization assay of swelling coals—N.N. Das Gupta, N.N. Chatterjee, S. Sanyal & K.K. Bhattacharya, CFRI, Jealgora. *J. Mines Metals Fuels*, **9** (4) (1961), 20-23.

Briquetting of coke fines—T.A. Subramanian, T.V. Subramanian & [illegible] S. Iyengar, CFRI, Jealgora. *J. Mines Metals Fuels*, 9 (5) (1961), 6-9.

On the origin of colour in copper ruby glasses—Atma Ram & S.N. Prasad, CGCRI, Calcutta. *Proc. nat. Inst. Sci. India* (Silver Jubilee No.), **26A** (Suppl. I) (1960), 12-25.

Mechanism of thermal decomposition of organo-montmorillonites—V.S. Ramachandran, S.P. Garg & K.P. Kacker, CBRI, Roorkee. *Chem. & Ind.*, **23** (1961), 790.

The Gohna land slip—P. Kumar, CBRI, Roorkee. *Sci. & Cult.*, **27** (1961), 243-47.

Boring and placing concrete for under reamed piles in ground with high water table—Subhas Chandra, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961), 216.

Influence charts for computing vertical stress distribution in soils—H. N. Anand, CBRI, Roorkee. *J. cent. Bd. Irrig.*, **18** (1961), 472-74.

Constant shear lines for unconfined compression test apparatus—Dinesh Mohan, CBRI, Roorkee. *Civil Engng. Pub. Works. Rev.*, **56** (1961), 921.

PATENTS & PROCESSES

Applications Accepted

69062: *Improvements in or relating to ferroelectric ceramic materials*—V.B. Tare, A.P.B. Sinha & A.B. Biswas, NCL, Poona.

70479: *Preparation of a non-shrinking and low expanding cement*—Mohan Rai, S.K. Chopra & N.K. Patwardhan, CBRI, Roorkee.

71169: *Process for the manufacture of ββ′-dichlorodiethylether*—N.R. Kuloor, Kanti Kathpalia & Chetan Dev Anand, Shri Ram Institute for Industrial Research, Delhi.

Applications Sealed

66298: *A new process for the manufacture of latex-cement for leather*—G.S. Rama Iyer & Y. Nayudamma, CLRI, Madras.

68055: *Improvements in or relating to complex mixtures of sulphides & polysulphides commonly known as oxidising salts*—O.P. Kulshreshtha & K.C. Srivastava, NPL, New Delhi.

Processes Ready for Exploitation

The following patented processes developed at the national laboratories are ready for commercial exploitation. Interested parties may correspond for details with the Secretary, National Research Development Corporation, New Delhi.

1. *Preparation of para-aminophenol and 2:4- diaminophenol* (Indian Pat. Nos. 53195, 60865 and 71978), NCL, Poona.

2. *Manufacture of dehydrated castor oil* (Indian Pat. Nos. 46457 and 55423) RRL, Hyderabad.

3. *Manufacture of enzyme depilant and bates* (Indian Pat. Nos. 52670, 54998 and 64354), CLRI, Madras.

4. *Manufacture of latex cement* (Indian Pat. No. 66298), CLRI, Madras.

Protein Hydrolysate

The Central Drug Research Institute, Lucknow, has developed a process (Indian Pat. No. 59455) for the preparation of protein hydrolysate from oil cakes (sesame and mustard). The hydrolysate is rich in methionine, lysine, tryptophane and other essential amino acids and can be readily blended with vitamins, minerals, malt or other additives for oral therapy of protein malnutrition and other disorders. The nutritive value of the product is comparable to that of imported hydrolysate preparations.

The process has been successfully scaled up to pilot plant production in collaboration with the Central Food Technological Research Institute, Mysore. The raw material (sesame, mustard cakes and papain) are indigenously available in abundance. The equipment needed for manufacturing the product is either available in the country or can be fabricated. The capital outlay for a unit producing 45 kg. of the product per day is Rs. 1.3 lakh in a factory provided with floor area, running water, electricity and steam. The cost of production on this basis has been estimated at Rs. 10 per kg.

Parties interested in taking up the process for commercial exploitation may contact the Secretary, National Research Development Corporation, New Delhi.

Process Leased Out

The process for the preparation of *Garlic Powder* (Indian Pat. No. 65138) developed by the Central Food Technological Research Institute, Mysore has been leased for commercial exploitation to Shri Jaikrishna N. Amin, Vallabhnagar Society, Odhav (Ahmedabad).

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CSIR NEWS

VOL. II 16.9.61 NEW DELHI—AUG. 28, 1961 : BHADRA 6, 1883 No. 16

MEETINGS

A meeting of the Executive Council of the Central Electronics Engineering Research Institute, Pilani, will be held at the CSIR Secretariat, New Delhi, on Aug. 30, 1961 at 3.00 p.m.

A meeting of the Executive Council of the National Metallurgical Laboratory, Jamshedpur, will be held at the Laboratory on Sept. 1, 1961 at 11.00 a.m.

Belting Leather—CLRI Demonstration

A process for the manufacture of chrome tanned belting leather from Indian raw hides will be demonstrated at the Central Leather Research Institute (CLRI), Madras from Sept. 20 to Oct. 9, 1961. Representatives of leather industry and tanneries who wish to attend the demonstration may send their particulars to the Director, CLRI, Madras.

The process has been standardised under the guidance of Dr. K. Wolf, Unesco Expert, working at the Institute.

PERSONAL

●SHRI Y. SUBRAHMANYA SARMA, Junior Scientific Officer, Central Board of Geophysics (CBG), Calcutta, has been appointed Junior Geophysicist in the Geophysical Research Wing of the CBG with effect from May 17, 1961.

●SHRI T.S. SODHI, Section Officer, CSIR Secretariat, New Delhi, has been appointed Administrative Officer, CIMPO, New Delhi, with effect from July 31, 1961.

●SHRI J. GURUSWAMI, Administrative Officer, CECRI, Karaikudi, has on transfer joined duty as Section Officer, CSIR Secretariat, New Delhi, with effect from Aug. 18, 1961.

●SHRI K. C. SUNDARACHARI, Section Officer, CLRI, Madras, has been appointed, on promotion, Administrative Officer, CECRI, Karaikudi, with effect from Aug. 5, 1961.

●SHRI O. A. ANTONY, Junior Scientific Officer, CEERI, Pilani, relinquished charge of his post from July 4, 1961.

●SHRI U. P. PRABHU, Junior Scientific Officer, CEERI, Pilani, relinquished charge of his post from Aug. 5, 1961.

* * *

●PROF. K.N. KAUL, Director, NBG. Lucknow, left for U.S.A. on Aug. 9, 1961 to attend the Tenth Pacific Science Congress of the Pacific Science Association at Honolulu, Hawaii (Aug. 21 to Sept. 6, 1961). Prof. Kaul will read his paper, Utility of Botanical Gardens in Modern World, at the symposium on 'Tropical Botanic Gardens in the Pacific and South East Asia', organised by the Congress. Before returning to India by the middle of September he will visit botanical gardens in Tokyo, Hong Kong, Manila, Singapore, Bangkok and Rangoon.

●DR. B. MUKERJI, Director, CDRI, Lucknow, left on Aug. 14, 1961 on tour to U.S.S.R., Sweden, England, France and Czechoslovakia. He will attend the Fifth International Congress on Biochemistry at Moscow (Aug. 15 to Aug. 21), First International Pharmacological Meeting at Stockholm (Aug. 22 to Aug. 25) and Annual Meeting of the British Association for the Advancement of Science (Aug. 27 to Sept. 9) and will deliver lectures at the Czechoslovak Academy of Science, Prague. Dr. Mukerji will return to Lucknow on Sept. 18, 1961.

●DR. Y. NAYUDAMMA, Director, CLRI, Madras, left for U.S.A. on Aug. 19, 1961 to attend the Biennial Congress of the International Union of Leather Chemists Society at Washington (Aug. 20 to Aug. 25). He will also visit various research institutes and tanneries in the States and will attend the International Leather Week at Paris.

Prof. Chandrasekhar to visit India

Prof. S. Chandrasekhar, F.R.S., the noted astrophysicist of Yerkes Observatory, University of Chicago, U.S.A. is visiting India. He will stay in India for a period of four months from Sept. 5, 1961 and will visit various scientific institutions and laboratories and deliver lectures and hold discussions.

Among the institutions which he will be visiting are Tata Institute of Fundamental Research, Bombay; Saha Institute of Nuclear Physics, Calcutta; Indian Institute of Technology, Kharagpur; Physical Research Laboratory, Ahmedabad; Nizamiah Observatory, Department of Astronomy, Hyderabad; Madras University, Madras; Indian Institute of Science, Bangalore; and Kodaikanal Observatory, Kodaikanal.

●DR. N.K. PATWARDHAN, Asst. Director, CBRI, Roorkee, has been deputed by the Government of India as a member of the National Productivity Council Team on Cement Industry for touring U.K., France and U.S.A. from Aug. 14 to Oct 5, 1961. He will also visit the various building research centres in European countries before returning to India by Oct. 21, 1961.

●SHRI S. P. VENKITESHWARAN, Asst. Director, NAL, Bangalore, proceeded on deputation to Rome to attend the United Nations Conference on New Sources of Energy (Aug. 21 to Aug. 31, 1961).

●DR. S. KRISHNAN and SHRI M.A. RAMASWAMY, Senior Scientific Officers, NAL, Bangalore, left for Canada on Aug. 6, 1961 for studies on the Blow-down Trisonic Wind

(Contd. on p. 2, col. 3)

BRIEFS

Symposium on Chemical Process Design

The two-day symposium on Chemical Process Design sponsored by the CSIR Chemical Research Committee at the Indian Institute of Science (I.I.Sc.), Bangalore concluded on July 25, 1961. More than 70 delegates from various institutions in India participated in the symposium.

Prof. A. Ramachandran of the I.I.Sc. and Prof. N.R. Kamath of the Indian Institute of Technology, Bombay welcomed the delegates. Prof. N.R. Kuloor of the I.I.Sc. read messages of good wishes from Shri Manubhai Shah, Minister for Industry, Prof. M. S. Thacker, Director-General, Scientific & Industrial Research, and Secretary, CSIR, on behalf of the Minister for Scientific Research & Cultural Affairs.

Twenty-nine papers received from scientists and technologists were presented and discussed in seven technical sessions under following four groups: (i) Process development (13 papers); (ii) Scaling up of chemical processes (2 papers); (iii) Chemical process equipment design (11 papers); and (iv) Operating experience of chemical production plants (3 papers). Professors N. R. Kamath, M.N. Rao, Staya Prakash, A. Ramachandran, P.S. Sarma, and Drs. S.S. Ghosh and A.N. Ghosh presided over the different sessions.

Training in Electroplating

A three-month course in Electroplating organised by the Central Electrochemical Research Institute, Karaikudi, concluded in July 1961. Trainees from the following industries and organisations attended the course: (i) Amco Batteries (Private) Limited, Bangalore; (ii) Office Equipment Corporation, New Delhi; (iii) Atomic Energy Establishment, Trombay; (iv) Small Scale Industries, Government of India; (v) Government Quality Marking Scheme, Moradabad (U.P.); and (vi) Ram Narain Ruia College, Bombay.

The course covered both theory and practice of electroplating and included following aspects: Fundamentals of electrochemistry and plating processes, preplating treatments including electrolytic and hemical polishing and plating of metals commonly met with in industries like automobiles and cycles, for decoration, corrosion resistance and engineering applications including decorative and hard anodizations.

Fifteen hours of extension lectures were also arranged for the trainees. At the end of the course, they were taken on visit to various industrial organisations in and around Bangalore and Madras.

Indian National Committee for URSI

The annual report (1958-59) of the Indian National Committee for the International Scientific Radio Union (URSI) has been published. The 58-page report records the work carried out by various institutions and individual scientists in India under the following seven commissions: Radio measurements and Standards, Tropospheric Radio, Ionospheric Radio, Radio Noise of Terrestrial Origin, Radio Astronomy, Radio Waves & Circuits, and Radio Electronics. The report includes the bibliography of papers published under each commission.

Institute of Petroleum

The Indian Institute of Petroleum in collaboration with the Oil & Natural Gas Commission is studying the requirements of finished petroleum products in Gujarat State and adjacent areas. The distribution arrangements for finished products are also being investigated. The findings will be utilised in the production pattern of the proposed refinery at Koyali (Gujarat State) which is likely to go into production in 1965.

Research Fellowships

The following have been awarded CSIR Fellowships for research in schemes noted against their names:

Senior Fellowships

1. SHRI SURENDRA NATH SINHA —*Studies in inorganic complexes* (Allahabad University, Allahabad).

2. SHRI ASHIT KUMAR BHATTACHARJEE—*Investigations on certain aspects of the properties and applications of ferrite cores with particular reference to itching circuits* (Birla College of Engineering, Pilani).

3 & 4. SARVASHRI SUNIL KUMAR GANGULY & SHYAMAPADA PAUL—*Synthesis and studies on antidiabetic drugs* (Bengal Immunity Research Institute, Calcutta).

Junior Fellowships

1. DR. V. V. KELKAR—*Pharmacological Research Unit* (Medical College, Baroda).

2. SHRI B. MUKERJEE—*Study of X-ray diffraction phenomena at low temperatures* (Indian Association for the Cultivation of Science, Calcutta).

3. SHRI A. S. NARAYAN NAIDU—*Physico-chemical processes in some sedimentary environments on the East coast of India* (Andhra University, Waltair).

4. SHRI DURGA PRASHAD TEWARI —*Study of molecular relaxation processes in liquids by ultrasonics* (University of Allahabad, Allahabad).

5. SHRI A. B. ROY—*Stereochemical investigation in heterocyclic systems* (University College of Science & Technology, Calcutta).

PERSONAL

(*Contd. from p. 1, col. 3*)

Tunnel (5 ft × 5 ft) in the National Aeronautical Establishment at Ottawa, under the Colombo Plan.

●DR. P. NILAKANTAN, Director, NAL, Bangalore, who had been to Amsterdam to attend the meeting of the Advisory Panel of the U. N. Special Fund in connection with the SUNFED aid for the Laboratory, returned to India on Aug. 7, 1961.

* * *

●DR. K.N. MATHUR, Director, CSIO, will represent the CSIR on the Society set up by the Ministry of Commerce & Industry for Management of the Industrial Design Institute at Ahmedabad.

*The following officers have been nominated member of the various committees of the Indian Standards Institution:

SHRI B. N. SASTRI, Chief Editor (Principal Member) and SHRI A. KRISHNAMURTHI, Editor (Alternate Member), Publications Directorate, CSIR, New Delhi—*Structure and Layout of Books & Periodicals Sub-Committee.*

DR. K. N. MATHUR, Director (or his representative) CSIO, New Delhi —*Dairy Laboratory Apparatus and Glasswares Sub-Committee.*

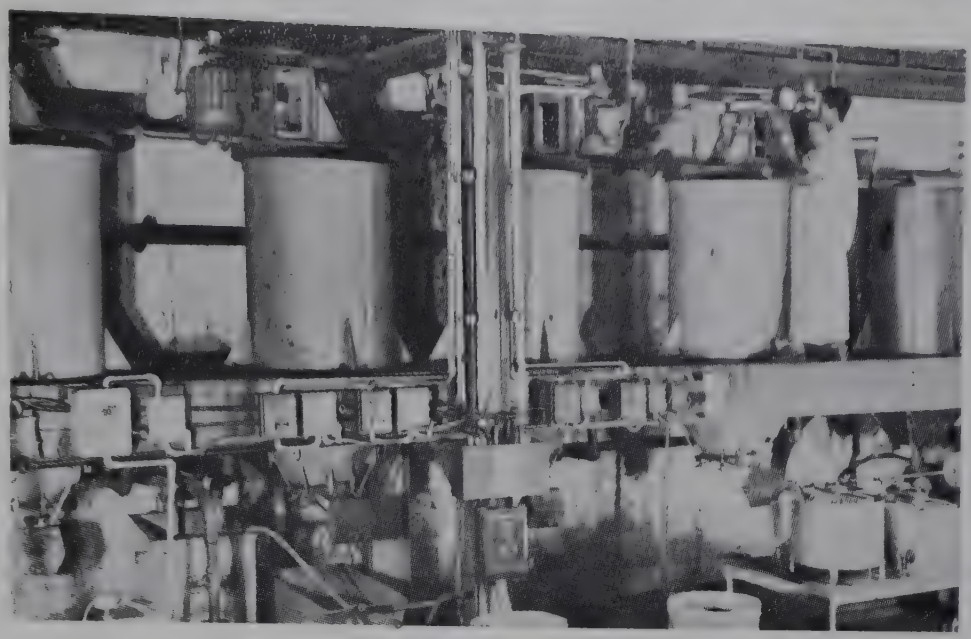
DR. H. V.K. UDUPA, Asst. Director (Principal Member) and Shri S. Ghosh, Senior Scientific Officer (Alternate Member), CECRI, Karaikudi—*Secondary Cells and Batteries Sectional Committee.*

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Production of Vanadium Pentoxide—Studies on the recovery of vanadium pentoxide from vanadiferous magnetite ores are in progress on a pilot plant installed at the Laboratory. Preliminary studies on the roasting of ores by soda ash followed by bleaching for the recovery of vanadium pentoxide have indicated that a recovery of 65 to 70 per cent of the vanadium from the ores may be achieved. Studies are in progress to increase the recovery of vanadium by the addition of oxidising agents, change in the temperature of roasting and retention period of charge in the kiln.



NML, JAMSHEDPUR—Pilot plant set up for the recovery of vanadium pentoxide

CFRI, JEALGORA

Action of Sulphuric and Phosphoric Acids on Coal—Studies carried out the Institute have shown that the reaction of coal with concentrated sulphuric and phosphoric acids brings about the following significant changes in its pyrolytic behaviour : (i) the formation of tar is entirely inhibited resulting in higher yields of char and (ii) irrespective of the ranks of coal (at least in the bituminous range), a constant proportion of the total carbon (about 92 per cent) of coal is found to be retained in its char. These results are almost identical to those observed earlier in case of coals dehydrogenated with sulphur or halogens. In the case of treatment with acids, however, no such dehydrogenation occurs even though the behaviour of the treated products on carbonization is the same except that the phosphoric acid tar inhibition is restricted to only low rank coals (carbon, 86-87 per cent)—B. K. Majumdar, S. Ganguly, N.G. De & A. Lahiri.

CFTRI, MYSORE

Enriched Tapioca Macaroni—An enriched tapioca macaroni product (protein, 18 per cent) consisting of a blend of tapioca flour, low fat groundnut flour, Bengal gram flour, semolina and fortified with calcium salts and essential vitamins, has been developed.

Feeding trials extending over a period of 6 months were carried out on weaned children (age, 8-36 months) and school children (age, 6-12 years) to evaluate the effect of a daily supplement of 2 oz. and 4 oz. respectively of enriched tapioca macaroni on the growth and nutritional status. Supplementation of the diet of children with enriched tapioca macaroni brought about a significant improvement in their growth and nutritional status as compared to the control group receiving modified tapioca macaroni not fortified with vitamins and minerals.

Storage of Onion—Application of maleic hydrazide fifteen days before harvest on onion plants has been found to extend the storage life of onion bulbs. The bulbs from treated plants can be stored for 4 months at room temperature and 8 months at optimum low temperature (32-35°F.) and 85-90 per cent relative humidity. The cost of such treatment has been estimated Re. 1 per 1,000 lb. of onion bulbs.

CDRI, LUCKNOW

Enzyme from Madar Latex—The enzyme from the latex of *Calotropis procera* (*Madar*) has been obtained in a highly purified form by removal of interfering basic proteins by hexametaphosphate and negative adsorption on calcium phosphate. The enzyme causes over 50 per cent reduction in the turbidity of cell wall preparations obtained from *Micrococcus lysodeikticus*. The ubiquitous presence of lysozyme in all tissues has led to the view that it is somehow concerned in the defence mechanism of the body against invading pathogens.

In vitro coagulation studies have indicated that latex of *Madar* possesses high anti-coagulant and fibrinolytic activity.

CLRI, MADRAS

CLRI Curing Salt—Efficacy of curing hide and skin with CLRI curing salt as compared to conventional Khari salt has been investigated. Skins cured with CLRI salt, after 9 months (including monsoon period) of storage in commercial godowns, were found to have 18 per cent damaged skin as compared to 44 per cent damaged skin found in the case of skin treated with Khari salt. Similar tests carried out by the British Leather Manufactures' Research Association, U.K. (who collaborated on this project) confirmed the improved efficacy of CLRI salt for curing.

RRL, HYDERABAD

Kolsit for Pig-iron Production—Low temperature semi-coke (Kolsit) produced by the Laboratory has been tested in the low-shaft furnace pilot plant in operation at the National Metallurgical Laboratory, Jamshedpur for production of pig-iron. The semi-coke has been found to be ideally suited for production of pig-

iron. In view of the encouraging pilot plant test results the Government of Andhra Pradesh is actively considering to set up a commercial low temperature carbonisation plant of 400 tons per day capacity at Kothagudem.

Hydrogenation of Castor Oil—In the course of studies on the hydrogenation of castor oil using a suitable catalyst, a process has been developed for the production of castor wax and 12-hydroxystearic acid. The latter is isolated from the hydrogenated product by saponification followed by acidification. Pilot plant trials are being carried out for evaluating the economics of the process.

Castor wax and 12-hydroxystearic acid find use in the production of lubricating greases, paints and varnishes, and cosmetics.

Sponsored Research

Tea Seed and Poppy Seed Oils—Stability and digestibility of hydrogenated tea seed oil and poppy seed oil have been investigated using hydrogenated groundnut oil and 'Dalda' vanaspati as controls.

For assessing the stability, the hydrogenated tea seed and poppy seed oils having slip points between 35.5° and 37.5° were taken for experiments. Test results indicate that the hydrogenated oils are equally stable and comparable to 'Dalda' vanaspati (slip pt, 35.5°).

Study of the digestibility of the hydrogenated oils using rats as experimental animals shows that the growth of animals fed on hydrogenated tea seed oil and hydrogenated poppy seed oil based-diet is similar to that fed on 'Dalda' vanaspati based diet—A.N. SAHA, H.N. BASU, University College of Science & Technology, Calcutta.

Studies on Open Channel Flows—Curvature effects in open channel flows and the phenomena of scour have been investigated.

Studies on guide banks (used for training of river in construction of bridges) using both electrical anology model and hydraulic model indicate that composite curves (of two or more different radii) are more efficient in guiding the flow past the guide bank than single radius simple curves. Minimum negative pressures are found in the case of composite curves ; the maximum scour depth is less. Hence composite curves, in addition, reduce the amount of protective works that are normally needed to ensure the safety of the guide bank.

Studies on open-channel bends reveal that the prevailing conception that erosion occurs at the outer bank of a curve is not fully correct. It is found that erosion occurs to a greater extent at the outer bank near the end of the curve and to a lesser extent at the inner bank near the beginning of the curve. The finding is significant in the designing of the protective works executed to keep the river margins safe—C. RAMAKRISHNA RAO, Indian Institute of Technolgy, Kharagpur.

Research Papers

Fischer Tropsch synthesis with a fluidized iron catalyst—N.G. Basak, S.R. Srinivasan, V.A. Krishnamurthi, A.C. Mazumdar & A. Lahiri, CFRI, Jealgora, *Chem. Age, Bombay*, **12** (1961), 14-22.

Adsorption of hydrogen and of cyclohexane on a molybdenum sulphide hydrocracking catalyst—N.C. Ganguli, S.K. Bose, K.A. Kini, N.G. Basak & A. Lahiri, CFRI, Jealgora. *Chem. Age, Bombay*, **12** (1961), 126-28.

Catalytic cracking of waxy distillate from Nahorkatiya crude—A.N. Narayanswamy, I.B. Gulati, A.N. Basu, & A. Lahiri, CFRI, Jealgora. *Chem. Age, Bombay*, **12** (1961), 193-97.

PATENTS & PROCESSES

Applications Accepted

70319 : *Improvements in or relating to the process of preparing N-methyl taurine*—G. P. Thakar & B.C. Subba Rao, NCL, Poona.

73730 : *A process for the preparation of urease from red gram* (Cajanus cajan)—Rajendralal Nath & P. Tapas Kumar Pradhan, School of Tropical Medicine, Calcutta.

Applications Sealed

66195 : *Preparation of lead dioxide electrodes for electrolysis*—H.V. Udupa & K. C. Narasimham, CECRI, Karaikudi.

66886 : *Improvements in or relating to bonding agents particularly suited for the manufacture of abrasive articles*—V. Nagarajan & R. T. Thampy, Shri Ram Institute for Industrial Research, Delhi.

68173 : *An improved process for the manufacture of ethylene dichloride*—Satish Chandar, R.K. Bhatnagar & N. R. Kuloor, Shri Ram Institute for Industrial Research, Delhi.

Processes Ready for Exploitation

DENSE CARBON AGGREGATES

The National Metallurgical Laboratory, Jamshedpur, has developed a process (Indian Pat. Nos. 62938 & 65696) for producing dense carbon aggregates from carbonaceous materials such as petroleum coke, retort carbon and bituminous coals.

Parties interested in utilising the process for large scale production may obtain the details, free of cost, from the Director, National Metallurgical Laboratory, Jamshedpur.

REINFORCED BAMBOO STRUCTURE

The Central Road Research Institute, New Delhi, has developed a process (Indian Pat. No. 56703) for utilization of bamboo in reinforced structures. The reinforced bamboo structure may be used as leaf spring in vehicles such as bullock-carts and tongas, in beams for roofs of low-cost houses, and in the making of cantilever bridges in hills and forest areas.

Interested parties may obtain details of the process, free of charge, from the Director, Central Road Research Institute, New Delhi.

NOVEL BEARING FOR VEHICLES

The conventional cylindrical bearings of vehicles do not last long due to gradual wearing out of shaft due to vibration caused as a result of development of play between shaft and bush.

The Central Road Research Institute, New Delhi has designed and developed a novel bearing (Indian Pat. No. 56704) which is six to eight times more durable than the conventional bearings. The design provides conical rubbing surfaces for both the bush and the shaft which eliminate vibration.

Interested parties may obtain details of the process, free of charge, from the Director, Central Road Research Institute, New Delhi.

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CSIR NEWS

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MEETINGS

A meeting of the Physical Research Committee will be held at the Physical Research Laboratory, Ahmedabad on Sept. 23, 1961 at 9.30 a.m.

A meeting of the Executive Council of the Central Drug Research Institute, Lucknow, will be held at the Institute during Sept. 25-26, 1961.

Symposium on Ferro-alloy Industry in India

A symposium on Ferro-alloy Industry in India will be held at the National Metallurgical Laboratory, Jamshedpur sometime in February 1962. The scope of the symposium will broadly cover the following aspects :

(1) Survey of raw materials for ferro-alloys production in India.

(2) Beneficiation of raw materials and assessment of recovery yields and economics data.

(3) Evaluation of electro-thermal, alumino-thermic, pyro-metallurgical techniques, etc. in the production of ferro-alloys in the context of indigenous resources.

(4) Basic physico-chemical and thermo-dynamic principles involved in the production of ferro-alloys including theoretical studies on slag and metal equilibria and related fundamental hypotheses.

(5) Latest advances in the production technology of ferro-alloys in relation to laboratory scale, pilot plant and industrial prototype production trials.

(6) Utilisation of by-products of ferro-alloy industries and overall production economics.

(7) Standard specifications for indigenous ferro-alloys based on corresponding specifications of the raw materials.

(8) Present status and future of ferro-alloy industry in India in the general background of world production trends.

Invitations are being extended to technologists, metallurgists and research scientists in India and abroad to attend the symposium and contribute technical papers for discussion.

Prof. Bates' Visit to India

Prof. L.F. Bates, F.R.S., Head of the Department of Physics, University of Nottingham, U.K., arrived at New Delhi on Sept. 9, 1961. He will be a guest of the Council of Scientific & Industrial Research during his stay in India. He will visit the following institutions: National Physical Laboratory, New Delhi (Sept. 11), Delhi University (Sept. 12), Muslim University, Aligarh (Sept. 13) and Regional Research Laboratory, Hyderabad and Osmania University, Hyderabad (Sept. 14 & 15). Prof. Bates will leave India for Hong Kong on Sept. 17, 1961.

PERSONAL

● DR. R. K. GHOSH has been appointed Officer-on-special duty (Concrete), CRRI, New Delhi, with effect from Aug. 23, 1961.

● DR. J. N. KARKUN has been appointed, on promotion, Senior Scientific Officer: Grade I, CDRI, Lucknow, with effect from Aug. 8, 1961.

● DR. K.L. ARORA has been appointed, on promotion, Senior Scientific Officer : Grade II, CDRI, Lucknow, with effect from Aug. 11, 1961. Dr. Arora had been to Czechoslovakia and Hungary for training in 'Fermentation with Special Reference to Production of Vitamins and Drugs' under the United Nations Technical Assistance Programme and resumed duty on Aug. 11, 1961.

● SHRI R. D. SRIVASTAVA has been appointed Senior Scientific Officer: Grade II (Architect), CBRI, Roorkee, with effect from July 24, 1961.

● SHRI B. S. SHARMA has been appointed, on promotion, Administrative Officer : Grade I, CGCRI, Calcutta, with effect from Aug. 10, 1961 *vice* Shri R. C. Biswas, transferred to RRL, Hyderabad.

● SHRI SRI KISHEN, Section Officer, CSIR Secretariat, New Delhi, has been appointed Administrative Officer: Grade II, NPL, New Delhi, with effect from Aug. 1, 1961.

● SHRI R. C. CHIB, Administrative Officer : Grade II, CMRS, Dhanbad, has been appointed Administrative Officer, CSIO, New Delhi, with effect from Aug. 24, 1961.

● SHRI L. R. A. RAMAN has been appointed Administrative Officer: Grade II, CEERI, Pilani, with effect from Aug. 21, 1961 *vice* Shri Kishan Lal transferred to Indian Institute of Petroleum.

● SHRI O. P. MATHUR has been appointed Accounts Officer, CDRI, Lucknow, with effect from June 26, 1961 *vice* Shri Ramji Mal who has been appointed Officer-on-special duty (Special Audit).

● SHRI K. L. VIJ, Section Officer, CDRI, Lucknow, has been appointed Administrative Officer: Grade II, with effect from July 23, 1961.

● SHRI A. P. ROY CHOUDHURY has been appointed Section Officer, CDRI, Lucknow with effect from May 15, 1961 *vice* Shri Jagdish Sahai transferred as Section Officer, CBRI, Roorkee.

* * *

● SHRI A. K. ROY, Officer-in-charge, Rain and Cloud Physics Research Unit, NPL, New Delhi, left for Australia on Sept. 9, 1961 to attend the International Cloud Physics Conference (Sept. 11 to Sept. 20, 1961) to be held at Canberra and Sydney.

● DR. M.M. DHAR, Senior Scientific Officer, CDRI, Lucknow, on completion of his training (12 months) in Medicinal Chemistry at Harvard University under the Rockefeller Foundation Award, returned to India and resumed duty with effect from Aug. 28, 1961.

(*Contd. on p. 4, col. 2*)

B R I E F S

Rockefeller Grant for NCL

A grant of $ 80,000 has been sanctioned by the Rockefeller Foundation, U.S.A. for purchase of equipment by the National Chemical Laboratory, Poona. The grant would be mainly utilised for obtaining nuclear magnetic resonance (n.m.r.) spectrophotometer (which is not available with the Laboratory) for structural studies of plant products and natural and synthetic colouring matters.

Watumull Awards for Indian Scientists

Dr. Sachimohan Mukerjee, Senior Scientific Officer, IIBEM, Calcutta and Dr. Krishna Kumar Tewari, Ex-Research Fellow (now Asst. Professor, Lucknow University), CSIR scheme, Metaphosphate in Microorganisms (Lucknow University, Lucknow) have been selected for Watumull Memorial Awards for Microbiology and Biochemistry respectively.

Dr. Mukerjee has received the award on the basis of his studies on *Typing of Cholera Vibrios by Bacteriophages*. Dr. Tewari has been selected for the award on the basis of his researches on *Metaphosphates*.

The awards, established last year in memory of the late G. J. Watumull by the Watumull Foundation (established in Honolulu, Hawaii in 1942) will be conferred on the scientists at a ceremony to be held in New Delhi in February 1962. In addition to a citation and a gold medal each recipient will be given Rs. 5,000 or $1,000.

Technical Publications in Tamil

The Central Leather Research Institute, Madras, has made a start in the publication of technical bulletins in Tamil for the benefit of regional leather industry.

At a function organized by the Institute on Aug. 17, 1961, Shri R. Venkataraman, Minister for Industries & Labour, Madras State released the following Tamil publications: (i) A process bulletin on 'Rapid Tannage of Sole Leather and (ii) a supplement to the monthly *Bulletin of the Central Leather* Research Institute. Janab M.J. Jamal Mohideen Sahib, Chairman, Leather Export Promotion Council presided over the function. Prominent tanners and representatives of the various associations connected with the leather industry were present.

The Tamil supplement to the Bulletin will be issued along with each issue of the Bulletin and will be supplied to interested subscribers at on extra cost.

Research Fellowships

The following have been awarded CSIR fellowships for research on projects noted against their names :

Senior Fellowship

SHRI A.B. RAY—*Stereo-chemical investigation in heterocyclic system* (University College of Science & Technology, Calcutta).

Junior Fellowships

1. SHRI G.P. PARIKH—*Studies on liquid crystals effect of structure on liquid crystal state* (M.S . University of Baroda, Baroda).

2. SHRI P.K. SRIVASTAVA—*Determination of constitution and synthesis of heterocyclic bases related to thiocarbamides* (Banaras Hindu University, Varanasi).

3. MD. MUKHTAR HUSSAIN—*Studies on solution of high dielectric constant* (Lucknow University. Lucknow).

4. SHRI TEJESHWAR DAYAL SETH—*Polarography of transition metals and their complexes* (University of Allahabad, Allahabad).

5. SHRI M.G. KANE—*Budde effect in halogens under electric discharge* (Banaras Hindu University, Varanasi).

6. SHRI A.V.R. KRISHNA RAO—*Investigations of heat-flow into soils* (Andhra University, Waltair).

7. SHRI P.N. KHANNA—*Pharmacological investigations of indigenous drugs* (L.M. College of Phramacy, Ahmedabad).

Research Schemes Terminated

The following research schemes have been terminated :

1. *Studies on the anatomy and comparative embriology of Indian scorpion*—M.I. College, Trivandrum (June 30, 1961).

2. *Investigation on insulations available in India for use in cold storage rooms and cheap house-hold air-conditioning*—Prof. R.N. Mehra, Punjab Engineering College, Chandigarh (June 30, 1961).

3. *Metabolism of oxalic acid in plants and animals*—Dr. P. S. Krishnan, Lucknow University, Lucknow (Aug. 31, 1961).

4. *Pilot plant preparation of ethylene oxide and products from the same*—Dr. N.R. Kuloor, Indian Institute of Science, Bangalore (Aug. 31, 1961).

5. *Special studies on salts and their solution*—Dr. D.D. Pant, D.S.B. Govt. College, Nainital (Aug. 31, 1961).

6. *Ultimate strength of R.C. beams in combined bending and sheer*—Prof. K. Subbiah, P.S.G. College of Technology, Coimbatore (Aug. 31, 1961).

7. *Vinyl acetate from alcohol*—Director, Shri Ram Institute for Industrial Research, Delhi (Aug. 31, 1961).

In Parliament

Regional Stations for Vegetable Preservation—Dr. M.M. Das, Union Deputy Minister of Scientific Research and Cultural Affairs, in reply to a question by Shri Jhulan Sinha informed the Lok Sabha that the Council of Scientific & Industrial Research had approved a scheme to set up six regional research stations and five sub-stations for fruit and vegetable preservation. Dr. Das said that a regional station at Bombay and sub-stations at Nagpur and Trichur had started functioning. Steps are being taken to start the stations at Lucknow and Gauhati during 1961-62. (*Sept. 4, 1961*).

Earthquakes Recorder—In reply to a question by Shri Raghunath Singh, Dr. M M. Das affirmed that CSIR Earthquake Engineering Centre at the Roorkee University was developing a new instrument to record earthquakes. The instrument is a simple pendulum which when shaken by an earthquake, records its motion on a smoked glass plate with a pointer attached to the pendulum (*Sept. 4, 1961*).

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Non-metallic Inclusions in Steel—The quality of steel is closely related to the nature, quantum and mode of occurrence of non-metallic inclusions in steel. Hence investigations were carried out for evolving a suitable method for the quantitative extraction of oxide inclusions from steels. An apparatus for extraction of oxide inclusions based on the principle of eliminating iron by dissolving it in alcoholic iodine has been designed and set up. The total oxygen in oxide residue was determined by vacuum fusion method, and is in good agreement with the calculated value.

CFTRI, MYSORE

Diphenyl Impregnated Wrappers—Laboratory studies have shown that wrappers impregnated with 30 to 40 mg. of diphenyl can effectively control the microbial spoilage in oranges, limes, mangoes, guavas, etc. Similar impregnated liners have been used effectively in packing the fruits for transportation to distant consuming centres. The process has been taken over by two firms for exploitation.

CLRI, MADRAS

Defects in E. I. Leathers—An assessment of the usual defects in hides and skins which cause deterioration in the quality of E.I. tanned leather has been made by examining the leathers with defects.

Warble defects were found in leathers of cow hides and goat skins from North India particularly from Kanpur and Calcutta markets. Pox marks were found common all over India both in goat and sheep skin leathers; the incidence being less in North India (5 per cent) and more in South India (Madras, 10 per cent and Dindukal, 25 per cent). Defects due to white spots were observed on the body of goat and sheep skins from North India and on the neck and bellies in skin obtained from South India, spots being more prevalent in South Indian skins. Rainy season defect was more prevalent in skins from Bombay region. Cow hides from Bihar showed tick marks. Holes, rub marks and thorn marks were observed in goat skins in general from South India. Defects due to improper curing (about 50 per cent) were found prominent in goat skins from Rajasthan. The cow hides from Mysore area (about 75 per cent) showed defects of putrefaction, scab formation, abscess and bed sores. The most prominent defect in Bihar buffalo hides was due to itch marks.

Phenolic Constituents of Babul and Myrab—Fractionation of the phenolic constituents of *Acacia arabica* (*babul*) and *Terminalia spp.* (*myrab*) liquors has been carried out by column chromatographic absorption on silica and charcoal as well as by continuous adsorption on hide powder, ultramide and charcoal. The eluted fractions do not show proper fractionation of the constituents on paper chromatograms. However, by counter current partitioning between methyl ethyl ketone and water in a ten stage separation, the phenolic constituents of low R_f values have been found concentrated in the earlier stage methyl ethyl ketone fractions and those with higher R_f values in water layer at the end fractions. The components have been confirmed on chromatograms.

Characterisation of the phenolic OH groups in the tannin by using molybdate and zinc acetate coloured complexes with spectrophotometric studies in ultra-violet and visible regions is under study. The shifting of the specific peak of hydroxyl group from invisible to visible region is being characterised by a study of model compounds under similar conditions.

Sponsored Research

Insulin in Protein Biosynthesis—With a view to study the role of insulin in protein biosynthesis, the uptake of amino acids by normal and diabetic livers of rats has been investigated. The uptake of methionine by diabetic livers is more as compared to that by normal livers. The effect of insulin on the uptake of methionine has been investigated both *in vivo* and *in vitro*. Insulin *in vivo* brings down the level of uptake of methionine by diabetic livers to normal. It also slightly suppresses the uptake of methionine by normal livers. However, insulin *in vitro* does not affect the normal and diabetic uptake of methionine.

The uptake of methionine is suppressed in the case of 'long term' diabetic rats and an outflow of methionine from tissue into the surrounding medium is observed. Insulin *in vivo* seems to be slightly effective in maintaining the normal uptake of methionine by 'long term' diabetic livers—K. GANAPATHI & R. BHATT, Haffkine Institute, Bombay.

Molecular Spectral Studies—Emission and absorption spectral studies on diatomic and triatomic molecules have been carried out. The spectroscopic evidence for the existence of the following diatomic molecules has been obtained: AgF, TeSe, CuTe, AgTe, AgSe and BiPb. A detailed vibrational analysis of the band spectra of these molecules confirmed their attribution. A number of new band systems have been observed and analysed in BiF, BiCl and BiI molecules. A large number of additional bands of the known band systems have been observed and analysed in AgCl and AgBr, molecules. The spectra of SbO and CdBr have been photographed in absorption for the first time and definite conclusions in regard to their ground states have been obtained—D. SHARMA, University of Allahabad, Allahabad.

Studies on Mustard Oil—Nutritive value of mustard oil and metabolism of erucic acid—the major constituent fatty acid of the oil—are being investigated. Mustard oil when fed at 10 per cent level of a synthetic diet to young rats has growth effect nearly similar to that of groundnut oil.

With a view to investigate the hydrolysis of mustard oil in gut, *in vitro* lipolysis of the oil has been carried out. It is found that the oil is easily hydrolysed by pancreatic lipase at p^H 7.8 and 37°C. and its rate of hydrolysis is comparable to that of groundnut oil. The mixed fatty acids obtained by hydrolysis have been isolated and their compositions examined by reverse phase paper chromatography. The liberated fatty acid is 100 per cent erucic acid. Oxidation of erucic acid with

mitochondrial preparations from liver homogenate has been taken up to assess the metabolism of erucic acid for calorigenic purposes. Preliminary study shows that erucic acid is oxidised more slowly than palmitic acid—B.C. GUHA & DIPTENDU GANGULY, University College of Science & Technology, Calcutta.

Underground Corrosion of Metals and Alloys—The corrosivity of soils (collected from selected spots on the Durgapur-Calcutta route) on cast iron and mild steel has been examined using electrolytic corrosion cells. The corrosion cells were dismantled after six months, and the combined weight losses of the anodes and the cathodes were determined. The corrosion of mild steel and cast iron varies with the nature of the soils. Attempt has been made to correlate the corrosivity of the soils on cast iron and mild steel with the following physical properties which determine the permeability of soils for air and water: particle size distribution, pore space, density, moisture equivalent and shrinkage. Total soluble salts, chloride, sulphate, carbonate, bicarbonate and nitrate contents of soil samples have been determined. A correlation has been observed between the weight losses of anodes and cathodes with the ratio of the total anions (expressed as meq. per 100 g. of soil) of soils to the water holding capacity of the soil—B. BHATTACHARJEE, M. SARKAR & K. RAY, Bengal Engineering College, Howarh.

Pigments from Lichens—Studies are in progress on the isolation and identification of pigments and other chemical compounds from Indian lichens. The presence of cryptoxanthin, lutein and another pigment with absorption maxima at 449 mμ and 480mμ has been inferred by chromatographic resolution of xanthophyll mixture obtained from *Roccella montagnei*.

A phenolic substance identified as methyl-β-orcinol has been isolated from *Parmalia tinctorum*. The phenolic compound is also obtained from the ether extract of the lichen without any chemical separation—S. RANGASWAMY & T. KRISHNAMURTHY, Department of Pharmacy, Andhra University, Waltair.

PERSONAL

(*Contd. from p. 1, col. 3*)

● DR. G. N. RAMACHANDRAN of the University of Madras, and Investigator-in-charge of the CSIR schemes returned to India after a four-month tour of West Germany, U. K. and Sweden. During his tour abroad he visited various laboratories, delivered lectures and attended the International Congress of Biophysics held at Stockholm.

* * *

● LT. GEN. H. WILLIAMS, Director, CBRI, Roorkee, has been nominated a member of the Local Planning Committee for the Indian Institute of Petroleum, Dehra Dun.

● Dr. K. N. SINHA, Officer-on-special duty, CMRS, Dhanbad, has been nominated Chairman of the Chains, Sheaves, Suspension Gears and Allied Items Sectional Committee, Indian Standards Institution.

Prof. G.S. Ramaswamy Deputy Director, CBRI, Roorkee, has been elected (i) a Full Member of the International Association on Shell Structures and (ii) a Member of the Institution of Engineers (India).

● PROF. RAMASWAMY, has also been nominated Chairman of the Committee set up by the Fertilizer Corporation of India for evolving general design features of buildings in the proposed permanent township of the Fertilizer Factory at Nahorkatiya.

● DR. J.S. AHLUWALIA, Officer-on-special duty, IIP, has been nominated a representative of the Ministry of Steel, Mines and Fuel on the Development Council for Organic Chemicals and Plastics, Ministry of Commerce and Industry.

● DRS. J. GUPTA & SUKH DEV, Asst. Directors, NCL, Poona, have been nominated members of the Chemical Research Committee of the CSIR.

● DR. M. PANCHOLY, Asst. Director, NPL, New Delhi, has been nominated a member of the Panel of Experts, Invention Promotion Board, Ministry of Commerce and Industry.

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● SHRI S. P. VENKITESHWARAN, Asst. Director, NAL, Bangalore, has been elected a Member of the Aeronautical Society of India.

● SHRI C.S.B. NAIR, Senior Scientific Officer, CFRI, Jealgora, has been elected an Associate Member of the Institute of Fuel, U.K.

● DR. H.C. SRIVASTAVA, Senior Scientific Officer, CFTRI Mysore, has become a Fellow of the Royal Agricultural Society, London and a Member of the New York Academy of Sciences, U.S.A.

● SHRI A.S. AIYAR, Junior Scientific Assistant, CFTRI, Mysore, has been awarded the Ph.D. degree by the Bombay University for his thesis, *Studies in Vitamins of the B Group*.

● SHRI V. RAMAKRISHNAN, Senior Research Fellow, Department of Chemistry, Annamalai University, has been awarded the Ph.D. degree by the Annamalai University for his thesis: *The Cryoscopic and Conductance Behaviour of Some Organic Compounds in Ethanolamine*.

Processes Leased Out

The following processes developed in the national laboratories have been leased out for commercial development.

1. *Rubber Base Contact Adhesive* (Indian Pat. No. 65977) NCL, Poona—(i) Paramount Rubber Products Co. of India, Kottayam; (ii) Laxmi Stores, Bombay; (iii) Plastipeel Chemical Corporation, Bombay; (iv) Sterling Chemical Co., Kanpur; (v) Chemisol Industries, Bombay; (vi) Shri P.M. Dhoot, Poona; (vii) Peoples Enterprises Pvt. Ltd., Calcutta; and (viii) Swastik Chemical Industries, Poona.

2. *Latex Cement* (Indian Pat. No. 66298), CLRI, Madras—(i) Jasoriya Rice Mills, Burdwan; (ii) Minco Products, Madras; (iii) The Kanjirapally Small Scale Rubber Industrial Cooperative Society Limited, Kerala; (iv) Shri A. Mahadevan, Katpadi (Madras State); (v) Bharat Adhesives, Delhi; (vi) Paramount Rubber Products Company of India, Kottayam and (vii) Shri G. Subramaniam, Madras.

3. Para-*aminophenol and 2:4-Diaminophenol* (Indian Pat. Nos. 53195, 60865 & 71978), CECRI, Karaikudi—Textile Aniline & Chemical Company Private Limited, Bombay.

4. *Enzyme Depilant and Bates* (Indian Pat. Nos. 52670, 54998 & 64354), CLRI, Madras—Leather Chemicals and Industries Limited, Calcutta.

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CSIR NEWS

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MEETINGS

Executive Council, CGCRI, Calcutta	Sept. 27, 1961	CGCRI, Calcutta, 11.30 a.m.
Advisory Committee, Rain & Cloud Physics Research Unit	Sept. 27, 1961	NPL, New Nelhi, 10.30 a.m.
Civil Engineering & Hydraulics Research Committee	Sept. 30, 1961	CSIR Secretariat, New Delhi, 3.00 p.m.
Extension Advisory Committee	Oct. 9, 1961	CSIR Secretariat, New Delhi, 10.30 a.m.
Biological Research Committee	Oct. 10, 1961	CSIR Secretariat, New Delhi, 10.00 a.m.
Publications Committee	Oct. 12, 1961	CSIR Secretariat, New Delhi, 3.00 p.m.

PERSONAL

● SHRI N.K. MAITRA, Senior Scientific Officer, CFRI, Jealgora, has been appointed Senior Scientific Officer : Grade I, Indian Institute of Petroleum (IIP), with effect from Nov. 8, 1960.

● DR. K.K. BHATTACHARYA has been appointed Senior Scientific Officer : Grade I, IIP, with effect from April 5, 1961.

● DR. I.B. GULATI, on transfer from CFRI, Jealgora, has been appointed Senior Scientific Officer : Grade I, IIP, with effect from June 19, 1961.

● DR. SULTANA Z. ALI has been appointed, on promotion, Senior Scientific Officer : Grade I, CFRI, Jealgora, with effect from Aug. 16, 1961.

● SHRI H.A. BALAKRISHNA RAO has been appointed Senior Scientific Officer : Grade I, CBRI, Roorkee, with effect from Aug. 30, 1961.

● SARVASHRI M. KURIEN, R.A. RAO & S.C. KAPOOR have been appointed Senior Scientific Officers : Grade II, IIP, with effect from April 24, May 1 & May 25, 1961 respectively.

● The following officers of the CFRI, Jealgora have been appointed, on promotion, Junior Scientific Officers, IIP : SARVASHRI ISHWAR CHANDRA & R.K. NIYOGI (Oct. 31, 1960), SHRI V.N. BADAMI (May 9, 1961) and SHRI J.M. SAGAR (May 12, 1961).

● Dr. V. S. NAIR, Junior Information Officer, Publications Directorate, CSIR, New Delhi is looking after the duties of Publicity Officer, in addition to his own, with effect from Sept. 18, 1961 consequent on Shri P. R. Gupta relinquishing charge of his post.

● DRS. R.S. KAPIL, P.C. BOSE and SARVASHRI M.M. VOHRA, RAM GOVIND, R.P. DAS, S.S. IYER, S.R. GUHA & S.K. SRIVASTAVA have been appointed, on promotion, Junior Scientific Officers, CDRI, Lucknow.

● DR. PRATAP SINGH has been appointed Junior Scientific Officer, CDRI, Lucknow, with effect from Aug. 10, 1961.

● SHRI K.M.L. BHATNAGAR has been appointed Junior Scientific Officer, IIP, with effect from May 16, 1961.

● DR. W.M. DESHPANDE has been appointed Junior Scientific Officer, CPHERI, Nagpur, with effect from Aug. 4, 1961.

● SHRI K.P. KACKER has been appointed Junior Scientific Officer, CBRI, Roorkee, with effect from Aug. 7, 1961.

● SHRI KISHAN LAL, on transfer from CEERI, Pilani joined as Section Officer, IIP, with effect from Aug. 29, 1961.

● DR. K.N. SINHA, Officer-on-Special Duty, CMRS, Dhanbad, left India on Sept. 1, 1961 for attending the International Conference of Directors of Safety in Mines Research Establishment in Poland and visiting mining research centres and modern mines in U.S.S.R., U.K., France, Belgium, Holand and Germany. In U.S.S.R., he will also study underground gasification of coal. He will return to Dhanbad in early November 1961.

● Dr. A. SREENIVASAN, Deputy Director, CFTRI, Mysore, left for New York on Sept. 19, 1961 for participating in the conference on 'Unsolved Problems of Thiamine' organised by the New York Academy of Sciences in commemoration of the twenty-fifth year of achievement in vitamin B_1 research. He will return to Mysore on Sept. 28, 1961.

● DR. N.K. PATWARDHAN, Asst. Director, CBRI, Roorkee, has been deputed by the Government of India as a member of the National Productivity Council Team on Cement Industry for visiting U.K. France and U.S.A. (Aug. 14 to Oct. 5, 1961). He will also visit building research centres in Europe before returning to India by Oct. 21, 1961.

* * *

● DR. B. MUKERJI, Director, CDRI, Lucknow and SHRI P.M. NABAR, Officer-in-Charge, CIMPO, New Delhi, have been nominated Members of the Development Council for Drugs and Pharmaceuticals, Ministry of Commerce & Industry.

● DR. V. SUBRAHMANYAN, Director, CFTRI, Mysore, has been nominated Chairman of the Technical Development Committee on Spices constituted by the Ministry of Commerce & Industry.

● DR. B.R. NIJHAWAN, Director, NML, Jamshedpur, has been nominated a member of the Committee constituted by the Ministry of Steel, Mines & Fuel to report on the suitability of Neyveli lignite for making iron.

(Contd. on p. 2, col. 3)

BRIEFS

Demonstration of CBRI Processes

The Central Building Research Institute, Roorkee, organized a course of lectures and practical demonstrations of processes developed at the Institute for the Assistant Block Development Officers of Uttar Pradesh from Aug. 16 to Aug. 23, 1961. The processes demonstrated are : Non-erodable mud plaster, roofing units for low roofs, and brick and block making machine.

CEERI Foundation Day

September 21, 1961 was declared as 'Open House' by the Central Electronics Engineering Research Institute, Pilani in connection with the Foundation Day celebration of the Institute. Representatives of the electronics industry were invited to visit the Institute with a view to foster closer relations with the industry and discuss problems of mutual interest.

BITM, Calcutta

A new gallery on 'Motive Power' was opened to public on Aug. 16, 1961. The gallery depicts the development of motive power from very early stage through models and charts and actual objects.

NML Annual Report

The Annual Report for 1960-61 of the National Metallurgical Laboratory, Jamshedpur has been published.

The 154-page (crown 4 to) report presents the work carried out by the Laboratory under the following heads : Research projects ; pilot plants ; engineering sections ; industrial liaison, operational research and project reports ; and information service. Research papers, investigation reports and survey reports published during the year are listed in appendices.

Research Fellowships

The following have been awarded CSIR Fellowships for research in schemes noted against their names :

Senior Fellowships

1. SHRI MANDIRA SARMA—*Study of amino acids and important enzymes in plant cells, both normal and abnormal* (Calcutta University, Calcutta).

2. SHRI V. NAGARAJAN—*Catalytic preparation of butyl alcohol from ethyl alcohol* (Indian Institute of Science, Bangalore).

3. SHRI T. VENKATARAM—*Investigation on the methods of inducing and maintaining drop-wise condensation on heat transfer surfaces* (Indian Institute of Science, Bangalore).

Junior Fellowships

1. SHRI T.P. GANDHI—*Pharmacognostic and pharmacological investigations of indigenous drugs* (L.M. College of Pharmacy, Ahmedabad).

2. SHRI M.D. SHROFF—*Synthesis of tetracyclines* (Institute of Science, Bombay).

3. SHRI V.D. MANJREKAR—*A systematic study, both fundamental and applied, of the clays and clay mineral of Madhya Pradesh* (University of Saugar, Sagar).

4. SHRI B.L. GHOSH—*Studies on the use of mixed antiseptics in the preservation of jute and inhibition of celluloses from jute-decomposing fungi* (Indian Jute Mills Association Research Institute, Calcutta).

Research Schemes Terminated

The following schemes have been terminated with effect from Aug. 31, 1961.

1. *Cytogenetic investigations on the genus Chlorophytum*—Prof. A. Abraham, University of Kerala, Trivandrum.

2. *Mixed and axial flow pumps of moderate discharge capacity*—Shri R.K.K.R. Govindarajan, P.S.G. College of Technology, Coimbatore.

3. *To set up secondary standards by microwave spectral lines*—Prof. H. S. Hans, Muslim University, Aligarh.

Research Schemes

The research scheme, *Role of riboflavin in the synthesis and regeneration of haemoglobin plasma and liver proteins and enzymes* (Investigator-in-charge : Dr. S. Mookerjea, Nagpur University, Nagpur) has been transferred from Nagpur University to Calcutta University.

* * *

Shri Krishnaji, Department of Physics, University of Allahabad, will supervise the research scheme, *Electronic conduction in single crystals of titanium dioxide* in the absence abroad of Dr. K. G. Srivastava, Investigator-in-charge of the scheme.

PERSONAL

(Contd. from p. 1, col. 3)

• DR. A. LAHIRI, Director, CFRI, Jealgora, has been nominated a member of the Standing Panel of Technical Experts to advise the Neyveli Lignite Corporation Ltd. and the Union Ministry of Steel, Mines & Fuel on matters relating to the Integrated Neyveli Lignite Project.

• DR. K.N SINHA, Officer-on-Special Duty, CMRS, Dhanbad, has beed nominated a member of the Committee constituted by the Coal Board to consider the protective works in Jogta Colliery against the spread of fire.

• SHRI Y.L. GLADEL, French Expert, IIP, has been nominated Maitre de Conferences of the University of Louvair (Belgium).

• DR J.S. AHLUWALIA, Officer-on-Special Duty, IIP, has been nominated a member of the Development Council for Organic Chemicals and Plastics, Ministry of Commerce and Industry.

• SHRI S.K. CHOPRA, Senior Scientific Officer, CBRI, Roorkee, has been nominated a member of the Panel for Cement Industry, Ministry of Commerce & Industry.

• The following officers have been nominated members of the various committees of the Indian Standards Institution :

SHRI S. BAGCHI, Deputy Director, CMRS, Dhanbad—*Coal Cutters, Coal Loaders and Conveyers Sectional Committee.*

DR. M.K. CHAKRAVORTY, Asst. Director, CMRS, Dhanbad—*Duty Conditions in Mines Sectional Committee.*

DR. D.S. BHATIA, Asst. Director, CFTRI, Mysore—*Desiccated Coconut Sub-Committee.*

DR. S.C. BHATTACHARYYA, Asst. Director (Principal Member) and DR. SUKH DEV, Asst. Director (Alternate Member), NCL, Poona—*Methods of Test Sub-Committee.*

SHRI R.V. LELE, Senior Scientific Officer, (Principal Member) and DR. S. MANDAL, Junior Scientific Officer (Alternate Member), CGCRI, Calcutta—*Electrical Insulator and Accessories Sectional Committee.*

SHRI S.S. BHATNAGAR, Senior Scientific Officer, NML, Jamshedpur—*Ball and Roller Bearings Sectional Committee.*

RESEARCH IN PROGRESS

National Laboratories

CFRI, JEALGORA

Vanadium-Iron Oxide Catalysts—X-ray studies have shown that stable vanadium-iron oxide catalyst suitable for oxidation of anthrancene to anthraquinone can be prepared by heating from 800 to 900°C. silica gel disseminated with vanadyl oxalate, ferric ammonium sulphate and potassium sulphate.

This has been concluded from a study of X-ray patterns of catalysts prepared by heating the product to 500°, 600, 700° and 800°C. The crystalline components of catalysts prepared at 500° and 600° could not be fully identified ; only bands of silica gel and V_2O_5 were observed. Warm water leaching of the catalysts followed by slow evaporation gave X-ray patterns showing the presence of $KFe(SO_4)_2$, jarosite, $KFe_3(SO_4)_2(OH)_6$, and possibly KVO_3 and α-K_2SO_4. The over-oxidizing character of the catalyst prepared at 500°C. has been ascribed to the large surface area of the silica gel which is covered with aggregates of vanadium oxide and potassium sulphate and iron ions.

In the case of catalysts prepared at 700°C. and 800°C., α-Fe_2O_3 crystallizes first, followed by α-crystobalite. Silica gel, when heated alone at 900°C. for 2 hr. remained unaffected—R.S. DUBEY & SULTANA Z. ALI.

Briquetting of Coke Fines—Coke fines (sizes, —6 mm. and—3 mm.) slightly contaminated with quick lime received from a firm were studied for briquetting using coke oven pitch (8-12 per cent) in the 1 ton/hr. low pressure pilot briquetting plant.

This study has shown that (i) crushing of the coke fines to 0-3mm. is not necessary but the pitch should be finely crushed ; disintegrator as part of the pilot plant can be dispensed with when fines of 0-6 mm. sizes are used, (ii) the moisture content of the raw material does not affect appreciably the briquetting property of coke fines in the range 5 to 10 per cent, though there is a slight general improvement with the increase in the moisture content ; and (iii) the quality of briquette improves as the binder percentage is increased ; briquettes cannot be made with less than 6 per cent pitch but fairly good and strong briquettes can be made with 10-12 per cent pitch—T. A. SUBRAMANIAN, T.V. SUBRAMANIAM & M.S. IYENGAR.

CFTRI, MYSORE

Insecticide from Clays—Insecticides comparable to D.D.T. formulations with respect to their effects on stored grain pests have been prepared from kaolinic clays by sulphuric acid activation at 400°C. The insecticidal potency of clays seem to be related to lipophilic action and not directly related to their desiccant properties as in the case of inert dust.

Pectic Enzyme—Studies on the production of pectic enzymes from *Aspergillus aureus* and *Penicillium expansum* by solid and shake culture method have given satisfactory results.

The enzyme produced has been tested for clarification of fruit juices and for the production of clear juices from pulps of guava, banana mango, papaya and other fleshy fruits. Organoleptic tests show that the clarified juices retain the flavour and aroma of the fresh fruits. Vitamin C content of the fresh fruit is unaffected in the clarified juice. Further work is in progress for the bulk production of enzyme and making concentrates of the juices.

Pectic enzyme concentrates such as 'Pectinols' which are used in beverage industry for clarification of fruit juice are at present imported from abroad.

CLRI, MADRAS

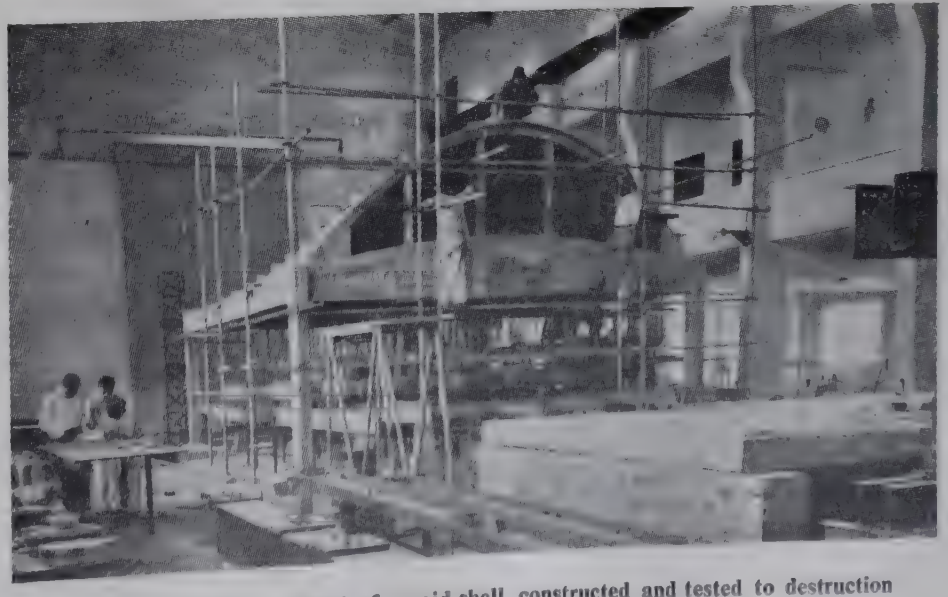
Tamarind Husk Extract—Tamarind husk extract containing about 25 per cent tannin has been found useful for boiler water treatment. The finding is based on researches carried out at the Institute and tests conducted by the Railway Research Organisation.

The husk is leached in aqueous medium by addition of 0.5-0 per cent aluminium sulphate which suppresses the swelling of husk and facilitates leaching. The tannin from the husk can be leached by (i) acetone extraction, (ii) battery system of conventional leaching and (iii) autoclaving, followed by filter pressing and conversion into solid extract.

CBRI, ROORKEE

Conoid Shells—Studies on conoid shell structures have been taken up as part of the research programme on doubly curved shells. Conoids are more economical than cylindrical northlight shells for roofing factory buildings demanding good daylighting.

A simplified method for finding membrane stresses in conoids by the use of a polynominal stress function has been completed. With a view to find out the actual stresses in



CBRI, ROORKEE—Model of conoid shell constructed and tested to destruction

conoids, a bending analysis was undertaken on digital computer using the simultaneous differential equations of Vlassov. The results are being processed.

A test to destruction was carried out on a half-full scale conoid model (25 ft × 20 ft) for about a fortnight. The test involved elaborate instrumentation. A large number of electrical resistance strain-gauge rosettes were employed to record the stresses in the shell. Other readings recorded included deflection and rotation measurements. One hundred units of conoids, each measuring 50 ft × 40 ft are under construction for Railways to roof their proposed Locomotive Component Works at Varanasi.

CRRI, NEW DELHI

Rail-Road Crossing—Study of traffic delays on busy rail-road crossings in Delhi is being carried out with a view to assess the economic loss arising out of delays of traffic at such crossings. The results of study may be helpful in establishing standards for economic feasibility of constructing over-bridges at rail-road crossings carrying heavy volume of traffic.

CSRI, BHAVNAGAR

Light Calcium Carbonate from Marine Gypsum—A process has been developed for the preparation of light calcium carbonate suitable for cosmetic and tooth paste industries starting with marine gypsum. The product has been tested by industry and found to conform to prescribed standards.

Sponsored Research

Vulcanisation of Rubber—Kinetics of rubber-sulphur reaction has been studied both in presence and absence of the accelerator, mercaptobenzthiozole (MBT). The reaction is of first order in both the cases. The energy of activation of the reaction is found to be 31 k. cal. in presence and 35 k. cal. in absence of MBT. Rate of crosslinking has been determined by measuring the equilibrium swelling in benzene at different stages. Attempts are being made to correlate the results with kinetic measurements.

Samples of vulcanised rubber prepared with varying concentrations of sulphur were subjected to ozonolysis. Separation of the products of ozonolytic degration by column chromatography and their identification by infrared and absorption spectraphotometry has been taken up—P.K. CHATTERJEE A.K. GANGULI & D. BANERJEE, Indian Association for the Cultivation of Science, Calcutta.

Monoglycerides and Acetoglycerides from Castor Oil—Various parameters like temperature, pressure, time and rate of heating and percentage of glycerol in the preparation of monoglycerides have been examined. Maximum amount of monoglycerides from castor oil is obtained on heating at 250°C. for 2 hr. in presence of carbon dioxide as catalyst, using 6-10 molar excess of glycerol.

Although the monoglycerides are good softening agents for rubber and other natural resins, they have poor compatibility with polyvinyl chloride resins. Hence, monoglycerides were converted into acetoglycerides by refluxing with an equivalent amount of acetic anhydride at 110-120° for 1 hr in an atmosphere of carbon dioxide. The yields were almost theoretical. Acetoglyceride samples prepared from castor oil were tested by two firms, who have reported their possible use as potential plasticizers for polyvinyl chloride resin—R.K. BHATNAGAR & R.K. KOCHHAR, Shri Ram Institute for Industrial Research, Delhi.

PATENTS & PROCESSES

Application Filed

78389 : *A process for the manufacture of briquettes and moulded shapes from slack coal, coke breeze after admixture with metallic ores and the like*—N. B. Biswas, T. V. Subramania, M. S. Iyengar & A. Lahiri, CFRI, Jealgora.

Applications Accepted

69919 : *A method for the preparation of guanidinoethyl phosphate*—(Mrs) Radhapant & S.S. Dubey, University of Allahabad, Allahabad.

70175 : *New method for the preparation of some 1,2,3,4-tetrahydroquinolines*—G. Thyagarajan, G.S. Sidhu & S.H. Zaheer, RRL, Hyderabad.

71302 : *Improvements in electronic wattmeters for measuring high and low power*—S.S. Banerjee & A.B. Bhattacharyya, Banaras Hindu University, Varanasi.

71321 : *Improvements in the process for the preparation of hydrazine compounds*—E.R. Saxena, D.S. Datar & S.H. Zaheer, RRL, Hyderabad.

76681 : *Preparation of a new series of organic compounds, viz., 1 (dialkylaminoalkyl) 1,2,3,4-tetra hydroquinolines*—G. Thyagara- jan, G.S. Sidhu & S.H. Zaheer, RRL, Hyderabad.

Application Sealed

66079 : *Improvements in or modification of a tensioning screw jack with particular reference to a pressure measuring device for recording the tension*—G.S. Ramaswamy, S.K. Narayana & D.S. Bhatnagar, CBRI, Roorkee.

Process Leased Out

The process for the preparation of *Liquid Rubber* (Indian Pat. No. 60555) developed by the National Chemical Laboratory, Poona has been leased out for exploitation to M/s K.N. Chari & Co., Madras.

Research Papers

The analysis and design of folded plates—G. S. Ramaswamy, M. Ramiah & V. C. Jain, CBRI, Roorkee, *Indian Concr. J.*, **35** (1961) 239-52.

Transformations of phases in the electrolytic alloys and specially in the alloys of copper-zinc and silver-copper—T. Banerjee & P.L. Ahuja, NML, Jamshedpur. *Mem. sci. Rev. Metallurg.*, **58** (1961), 309-16.

Diesel oil and lubricating oil from catalytic cracking of paraffin wax—N.G. Basak, G.S. Bhargava & A. Lahiri, CFRI, Jealgora, *Chem. Age, Bombay*, **12** (1961), 198-203.

The planning of Central Washery at Bhojudih—G.G. Sarkar, D. Basu, S. Sakha & A. K. Moitra, CFRI, Jealgora. *J. Mines Metals Fuels*, **9** (6), (1961) 1-10.

Evaluation of zeta—potential with correction for cell constant and surface conductance—B. N. Ghosh, & P. K. Pal, University College of Science, Calcutta. *Trans. Faraday Soc.*, **57** (1961), 116.

Studies on stability and electrokinetic potential of sulphur hydrosol —B. N. Ghosh & A. K. Gangopadhay, University College of Science, Calcutta. *J. Indian chem. Soc.*, **38** (1961), 69.

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CSIR NEWS

VOL. 11 NEW DELHI—NOV. 27, 1961 : AGRAHAYAN 6, 1883 No. 22

MECHANISATION OF MINES IN INDIA

A symposium on the Mechanisation of Mines in India sponsored and organised jointly by the Central Mining Research Station (CMRS), Dhanbad, the India Branch of the Association of Mining, Electrical & Mechanical Engineers and the Journal of Mines, Metals & Fuels will be held at CMRS during Dec. 9-12, 1961. Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, will inaugurate the symposium.

About seventy papers covering various aspects of mechanisation of mines will be presented and discussed under the following technical sessions :

(1) Winning, Methods of Work & Detailed Operations

(2) Transport

(3) Ventilation, Blasting and Allied Subjects

(4) Supports and Roof Control

(5) Safety and Control

Besides, four special lectures on Mine Mechanisation with special reference to India will be delivered.

About five hundred mining engineers from India and abroad (U.S.A., U.S.S.R., U.K., Canada, France, West Germany, Poland and New Zealand) are expected to participate in the symposium. Amongst the foreign delegates who are expected to attend the symposium are : Prof. Atkinson of U.K., Dr. Lydin and Prof. Mankovski of U.S.S.R., Prof. Fritzche of West Germany, Dr. Krupinski of Poland, Dr. C. Bihl of France and Dr. Damon of U.S.A.

Conjointly with the symposium, an Exhibition of mining machinery and equipment will be held in which leading firms from U.K., U.S.A., Germany and Hungary will demonstrate various mining machineries.

PERSONAL

Appointments

SHRI G.S. RAMAKRISHNA RAO—Senior Scientific Officer : Grade I, NML, Jamshedpur (Oct. 28, 1961).

SHRI I.P. KARNA—Electrical & Mechanical Engineer, NML, Jamshedpur (Oct. 27, 1961).

SHRI SURESH CHANDRA—Junior Scientific Officer, NML, Jamshedpur (Nov. 3, 1961).

Promotions

SHRI C.A. TANEJA—Senior Scientific Officer : Grade II, CBRI, Roorkee (Oct. 6, 1961).

SHRI S.B. DAS GUPTA—Senior Scientific Officer : Grade II, NML, Jamshedpur (Oct. 4, 1961).

SARVASHRI P.V. RAMAN, B.L. SEN GUPTA & S. K. BOSE—Junior Scientific Officers, NML, Jamshedpur (Oct. 4, 1961).

Deputations

DR T. BANERJEE, Deputy Director, NML, Jamshedpur—*France* : For visiting centres of research and laboratories engaged on Electrometallurgical works for a period of 6 weeks under the Indo-French Technical Cooperation Agreement (Oct. 12, 1961).

SHRI R.D. GUPTA, Senior Scientific Officer, NML, Jamshedpur—*U.K.* : Training in Recent Technology of Steel Making with its practical application to industry and casting techniques, operation and control of electric arc and allied furnaces for 6 months under the Colombo Plan (Oct. 9, 1961).

SHRI V.K. VAISH, Senior Scientific Officer, CGCRI, Calcutta—*U.K.* Training in the Operation of Moulding, Paddling and Pressing Optical Glass Blanks and Plates in U.K. Optical Co. Ltd., for 3 months under the Colombo Plan.

* * *

DR. N.K. PATWARDHAN, Asst. Director, CBRI, Roorkee returned to India on completion of seven-week study tour of the Cement

(Contd. on p. 4, col. 2)

Shri P. I. A. Narayanan

Shri P.I.A. Narayanan has been appointed, on promotion, Officer-in-charge (Ore Dressing), N M L, Jamshedpur, with effect from July 7, 1961. Born at Kollengode in Kerala (1910), Shri Narayanan got his B.Sc. Degree in Metallurgy from Banaras Hindu University (1934). He started his career as assayer and metallurgist in a tin wolfram separation plant and then worked as mining engineer and metallurgist in a gold prospecting company. For sometime he served as metallurgist, Geological Survey of India, and as mill superintendent, zawar lead-zinc mine. He joined the NML as Assistant Director (Ore Dressing) in 1948 and since then has carried out laboratory and pilot plant studies on various ores (particularly of manganese, iron and chromium), and developed flowsheets for their treatment. A pilot plant for beneficiation of manganese ore and other ores is being set up at the laboratory under his supervision.

Shri Narayanan visited ore dressing laboratories and pilot plants, and milling plants in Australia, France, U.K., Belgium and West Germany. He participated in International Mineral Processing Congress held in London in 1960. Shri Narayanan has published over 100 papers in Indian and foreign journals and is an author of the monograph 'Beneficiation of Low-Grade Manganese Ores of India'.

He is a member of the American Institute of Mining, Metallurgical & Petroleum Engineers ; Institution of Mining & Metallurgy, London ; Mining, Geological & Metallurgical Institute of India ; and Indian Institute of Metals. He is a Co-ordinating Officer for India for the Commonwealth Committee on Mineral Processing.

B R I E F S

Technical Personnel Exchange Programme

The Central Leather Research Institute, Madras has initiated a programme of exchange of technical personnel of the Institute with those of Industry. Under this programme, the organisations connected with leather industry will depute a suitable senior person to the Institute as 'Guest Worker' for a period of about 6-8 weeks, to get acquainted with the investigations carried out in the various departments of the Institute and also to work on problems of special interest to industry. In exchange, a senior research staff of the Institute will be deputed to work in this organisation during this period.

Under this programme, the first Guest Worker, Shri K.V. Vaidyalingam, Managing Director, *The Skins & Leather Private Ltd.*, Coimbatore, has joined the Institute and Dr. B.C. Basu, Junior Scientific Officer of the Institute, has been deputed, in exchange, to work at the factory.

CLRI Practical Demonstration

The process for the manufacture of 'Natural Chrome Lining Leather from Sheep Skins (rejected quality)' developed by the CLRI, Madras is being demonstrated at the Institute from Nov. 20, 1961 for the benefit of tanners. The process utilises only indigenous materials and does not involve the use of a drum. The demonstration is expected to continue till Dec. 11, 1961.

Chrome lining leather is in steady demand from shoes and other footwear manufacturers.

Hard Chromium Plating Course Concludes

The Second course on Hard Chromium Plating organised during the year by the Central Electrochemical Research Institute, Karaikudi for the benefit of Railway personnel concluded with the distribution of certificates by Shri M. Ananthasayanam Ayyangar, Speaker, Lok Sabha, New Delhi. Eleven trainees representing following organisations received certificates : Northern Railway, Southern Railway, North-East Frontier Railway, Chittaranjan Locomotive Works, and Integral Coach Factory.

Training in Radar

The following persons have been selected for 4-week practical training course in Radar started at the Air Force Technical College, Bangalore on Nov. 1, 1961 :

1. Shri M.B. Gautam, Agra College, Agra
2. Shri J. S. Sidhu, Central Electronics Engineering Research Institute, Pilani
3. Shri K.M.M. Rao, Andhra University, Waltair

Building Digest

The Central Building Research Institute, Roorkee has started bringing out a series of Building Digests on selected topics for use of building engineers and architects in India. The first in the series brought out in November 1961 describes some important aspects of *Orientation of Buildings.*

The 6-page Digest gives values for solar load and solar heat gain by buildings of different orientations in some important locations in India taking a simple building with flat roof, 30 ft × 60 ft and 12 ft high, as basis for calculations.

Copies of the Digest are available free from the Director, Central Building Research Institute, Roorkee.

Seminar on Aeronautical Sciences

The seminar on 'Aeronautical Sciences' organised by the National Aeronautical Laboratory, Bangalore (*CSIR News*, Vol. 11, No. 21, p. 2) will be inaugurated by Shri Jayachamaraja Wadiyar, Governor of Mysore, on Nov. 27, 1961 at 9.00 a.m. Prof. M.S. Thacker, Director-General, Scientific & Industrial Research, will preside over the inaugural function.

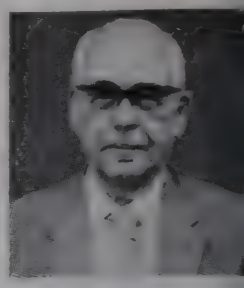
Unesco Advisory Committee Visits National Laboratories

The Unesco International Advisory Committee on Research in Natural Sciences Programmes visited the NBG, Lucknow and CGCRI, Calcutta on Oct. 23 and Oct. 25, 1961 respectively. The Committee evinced keen interest in the various projects of the laboratories.

The NBG, Lucknow has been recognised as a centre for post-graduate research for the award of Ph. D. degree in Botany by the Universities of Panjab, Agra and Karnataka.

Prof. Gates' Visit to RRL, Jammu

Prof. Regmald Ruggles Gates, F.R.S., the internationally known Cytologist, Geneticist and Anthropologist and the guest worker at the Indian Statistical Institute, Calcutta visited the Regional Research Laboratory, Jammu on Sept. 27, 1961.



He was taken round the Laboratory and the Ramnath Chopra Garden of Medicinal Plants where he evinced special interest in the mutations produced by colchicine, X-rays and gamma rays and the genetical work done on drug plants. He addressed the members of the staff on his pioneering works including on mutations and human genetics.

Shri J.M. Dave

Shri Jayadev Mohanlal Dave, B.E. (Civil), Gujarat University; M.S. (Sanitary Engng) and M.P.H. (Air Pollution and Industrial Hygiene), Minnesota University, U.S.A. has been appointed Assistant Director, CPHERI, Nagpur with effect from Sept. 25, 1961.

Shri Dave (*b.* Nov. 29, 1927; Gwalior) after obtaining B. E. Degree in 1951 joined the Burmah Shell Refinery Project at Trombay. In 1954, he proceeded to U.S.A. and worked for three years as Consulting Engineer with M/s Toltz, King, Duvall and Associates of St. Paul and M/s Hitchcock & Estabrook Inc. of Minneapolis as Chief Sanitary Engineer. He was appointed Public Health Engineer, Minnesota State Board of Public Health in 1957 and later in Oct. 1958 his services were acquired by the United States Public Health Service for the R.A. Taft Sanitary Engineering Research Centre, Cincinnati, Ohio where he was associated with the National Air Pollution Sampling Net Work.

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Iron from Andhra Pradesh Ores—Extensive studies in the Low Shaft Furnace Pilot Plant carried out at the Laboratory have shown that acceptable grades of pig iron can be produced from iron ore, limestone and non-coking coal/low temperature carbonized coke obtained from Singareni collieries (Andhra Pradesh). The use of low temperature coke is, however, considered economic for commercial scale production of iron in Andhra Pradesh as the by-products of coking process can be utilised.

CFRI, JEALGORA

Catalytic Cracking of L.T.C. Tar Fractions—Neutral oil fractions of middle oil obtained in Lurgi-Spulgas pilot plant by low temperature carbonisation of Upper Kajora and Jambad-Bowlah coals have been cracked over co-precipitated silica-alumina and active carbon catalysts. The liquid reaction products have been found to be of much lower viscosity and initial boiling point than the feed, and contain substantial amount of distillates below the boiling range of the feed. Lighter fractions up to 50 per cent of feed are obtained under certain conditions. With rise of reaction temperature, the yield of liquid products decreases, while that of gas increases. The reaction products are more aromatic than the feed. The viscosity and specific gravity of the product are unchanged when stored for one month. Recycling of the reaction products over the fresh catalyst does not make a substantial change in the yield of light products showing that the products are refractory to further cracking. Analysis of products leads to the conclusion that splitting of the side-chain, dehydrogenation and condensation to some extent are the main reactions that take place when silica alumina catalyst is used—P.R. Roy, I.B. Gulati, A.N. Basu & A. Lahiri.

Up-grading Coal Slurry in Autogenous Cyclones—Studies on up-grading of high-ash raw coal slurries carried out with different types of slurries (prepared in the laboratory from Jharia coals or collected from commercial or pilot washery) have indicated that the autogenous cyclone (using water as medium) holds good promise for treatment of slurries particularly when the up-grading does not involve drastic reduction in ash content. As much as 88 per cent of cleaned slurry with about 15-16 per cent ash can be obtained from slurry having raw fines with 19-19.5 per cent ash. Under normal conditions, the autogenous cyclone can give as good a performance as the flotation cell, but the range of efficient cleaning is, however, limited to a bottom size of 240 mesh. Autogenous cyclones are economical and effective for treating slurries in view of their low installation and operating costs, less floor space requirement and easy and accurate control over separation—D. Basu, A.K. Chakravarti, G.G. Sarkar, & A. Lahiri.

CBRI, ROORKEE

Lime-Slag Cement—Studies on the utilisation of blast furnace slag have shown that wet-ground slag mixed with lime and sand compares favourably with cement-lime-sand mixes for use as masonry mortars and plasters. The lime-slag-sand mortar is resistant to the attack of sulphates and hence, can be used for constructions in sea water and underground foundation work.

A mixture of lime, slag and sand in the ratio of 1: 2: 9 gives a strength of 1,200 lb./sq. in. when cured for a period of seven days at a relative humidity of 100 per cent at room temperature, whereas portland cement-lime-sand mixture in the ratio of $1\frac{1}{2}$: $1\frac{1}{2}$:9 gives a strength of 1,100 lb./sq. in. when cured under similar conditions. The strength of the lime-slag mix may be further improved by addition of chemicals—L. C. Jain.

Sponsored Research

Sediment Mechanics—Studies on the mechanics of sediment transportation and scour have been carried out with the object of replacing the existing empirical rules of design in hydraulic works by rational procedures.

The effect of geometry of the blocks on stability, the principle for the determination of the optimum length for the pitching and need for using filter backing for talus have been investigated for understanding the stability of loose stone aprons. The stability of the loose stone pitching, whether of cubes or of irregular stones, has been found to be a function of the Froude number. There seems to be no special advantage of adopting geometrical forms such as cubes for the loose stone. But the size of stone to be used for ensuring stability depends upon the mean velocity of flow. The optimum length for the pitching is up to the point of deepest scour obtained for the condition when no pitching is used. Uneven subsidence of pitching, as distinguished from launching, can be controlled by using a layer of quarry rubbish below the pitching to act as an inverted filter.

The flood scour at barrages, both downstream and upstream, have been studied. The use of light-weight materials such as coal for the bed, tilting of the bed, and injection of the sediment as in river models have helped to stimulate the hydraulic features more satisfactorily than in the conventional models run on the basis of Froude's law.

The head losses in silt ejector tunnels were found to be greater for sediment-laden water than for clear water, the discharge remaining same,

The effect of bends in the ejector tunnels influences the head losses not only in the bend but also in the straight reach in continuation. Hence, the conventional method of computation of head lossess using Manning's equation has not been found applicable.

A study of the problem of the design of stable channels in erodible materials has shown that the stability of a channel can be correlated with the Froude number and that the maximum value for stability should not exceed 0.3. Some of the recent equations furnished by Lacey on analytical basis have been verified experimentally. The results regarding the relationship between discharge hydraulic mean radius and area of cross-section for coarse non-cohesive material have been found to be in agreement

with field data obtained by Simons and Albertson—J. VISWESWARA RAO & V. VASUDEVA MURTHY, Civil Engineering Department, Indian Institute of Technology, Kharagpur (1958-1961).

Research Papers

Some important characteristics of neem oil and its standardisation—C.R. Mitra, NBG, Lucknow. *Indian Oilseeds J.*, **5** (1961), 204-7.

Utilization of *Argemone* seed—G. Misra, C.R.Mitra & K.N. Kaul, NBG, Lucknow. *Indian Oil Soap J.*, **27** (1961), 11.

Constituents of Ambrette seed—G. Misra, V.N. Sharma, C.R. Mitra & K.N. Kaul, NBG, Lucknow. *Soap Perfum. Cosm.* (*Lond.*) **34** (1961), 761.

Studies in Polypodiaceae—VII: *Pyrrosia*—B.K. Nayar, NBG, Lucknow. *J. Indian bot. Soc.*, **40** (1961), 164-85.

Polynominal stress functions for parabolic conoids—G.S. Ramaswamy, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961), 284-87 & 290.

Movable shuttering for folded plate roof of museum building at CBRI, Roorkee—G.S. Ramaswamy, Z. George & B.V. Srinivasa Rao, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961), 303-6.

Development of low-loss steatite bodies using Jaipur talc—S.B. Roy, CGCRI, Calcutta. *Trans. Indian ceram. Soc.*, **20** (1) (1961), 1-6.

Polarographic methods for estimation of certain constituents in silicates—S. Kumar & B.C. Sinha, CGCRI, Calcutta. *Trans. Indian ceram. Soc.*, **20** (1) (1961), 15-18.

Fertilizer from coal—Part I: Production—P.N. Mukherjee, J.N. Bhowmik, A.K. Banerjee, L.V. Ramchandran & A. Lahiri, CFRI, Jealgora. *Proc. nat Acad. Sci.*, **31A** (1961), Pt I, 124-26.

Coal production and preparation trends in U.S.A.—S.K. Majumdar, CFRI, Jealgora. *J. Mines Metals Fuels*, **9** (1961), 8 & 12.

Observations on the rotifers from shallow ponds in Delhi—M.G. George, University of Delhi, Delhi. *Curr. Sci.*, **30** (1961), 268-69.

PERSONAL

(*Contd. from p. 1, col. 2*)

Industry in U.K., France and U.S.A., sponsored by the National Productivity Council of India under the T.C.M. aid. He also visited the Building Materials Research Laboratories in U.K., Germany, Switzerland and Italy.

Nominations

DR. ATMA RAM, Director, CGCRI, Calcutta—Director, Board of Directors, National Research Development Corporation of India, New Delhi.

DR. Y. NAYUDAMMA, Director, CLRI, Madras—Chairman, Ad hoc Leather Board, Government of Andhra Pradesh.

DR. K.N. MATHUR, Director, CSIO, New Delhi—Member, Governing Council and Executive Committee, Indian Standards Institution, New Delhi; Member, Faculty of Science, University of Delhi, for a period of 3 years from October 5, 1961.

DR. AMARJIT SINGH, Deputy Director, CEERI, Pilani—Member, Radio & Cable Board, Ministry of Transport & Communications, New Delhi.

SHRI K.D. SHARMA, Deputy Director, CGCRI, Calcutta—Member, Ophthalmic Glass Projects, National Instruments Ltd., Calcutta.

DR. M.U. PAI, Asst. Director, NCL, Poona—Chairman, Chemicals (Misc.) Sectional Committee, Indian Standards Institution.

DR. J.S. PRUTHI, Senior Scientific Officer, CFTRI, Mysore—Member, Indian Central Spices and Cashewnut Committee, Indian Council of Agricultural Research, New Delhi.

Honours & Awards

DR. N.S. KAPUR, Senior Scientific Officer, CFTRI, Mysore—Fellow, Royal Institute of Chemistry, London.

SHRI K.G. KATWEY, Asst. Director, NAL, Bangalore—Member, Indian Statistical Institute, Calcutta.

SHRI K.Y. SHRIKHANDE, Senior Scientific Officer, CFRI, Jealgora—Associate Member, Institute of Fuel, U.K.

SHRI. G.T. GADRE, Senior Scientific Officer, CSMCRI, Bhavnagar—Declared eligible for the award of Ph.D. Degree by the University of Poona for his thesis: *Pentavalent Phosphorus Compounds*.

PATENTS & PROCESSES

Applications Filed

INDIA

78015: *Acetex process for the extraction of tar acids*—D.K. Sen, C.S.B. Nair, A.N. Basu & A. Lahiri, CFRI, Jealgora.

78016: *Improvements in the production of thermosetting resins*—R.T. Thampy & M. Krishnan, Shri Ram Institute for Industrial Research, Delhi.

PAKISTAN

843/61: *A process for the production of terpineol and terpin hydrate*—S. J. Hasan, B. Bhushan & S.H. Zaheer, RRL, Hyderabad.

Application Accepted

71979: *An improved process for the manufacture of monoglycerides*—R.K. Kochhar & R.K. Bhatnagar, Shri Ram Institute for Industrial Research, Delhi.

Applications Sealed

U.K.

866809: *Improvements in or relating to the preparation of costus root oil and the products thereof*—G.R. Kelkar & S.C. Bhattacharyya, NCL, Poona.

857163: *A process for the preparation of tridecane-1:13-dicarboxylic acid or its ester suitable for the preparation of exaltone (cyclopantadecanone)*—B. B. Ghatgey, U.G. Nayak, K.K. Chakravarti & S.C. Bhattacharyya, NCL, Poona.

Processes Leased Out

The following processes developed at the national laboratories have been leased out for commercial development:

1. Rubber base contact adhesive (Indian Pat. No. 65977), NCL, Poona—*Metal Adhesives Industries*, Bombay.

2. Catalysts for removal of inorganic sulphur from industrial gases (Indian Pat. No. 55816), CFRI, Jealgora—*Durgapur Projects, Limited*, Calcutta.

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CSIR NEWS

VOL. 11 NEW DELHI—DEC. 11, 1961 : AGRAHAYAN 20, 1883 No. 23

SYMPOSIUM AND SEMINAR

Symposium

A symposium on 'Recent Advances in Plant and Animal Viruses' will be held at Cuttack on Dec. 31, 1961 and Jan. 1, 1962. Jointly sponsored by the CSIR and the National Institute of Sciences of India, the symposium is being convened by Dr. T. S. Sadasivan, Professor, University Botany Laboratory, Madras.

About 20 research papers pertaining to the following topics including soil-borne virus diseases and virus research in India will be presented and discussed:

Plant Virus—Inorganic nutrition and virus multiplication; transmission of viruses by white flies; virus diseases in fruit trees and decline of citrus in India; control of virus diseases; morphology, structure, serology, and inhibition of viruses; biosynthesis of viral nucleic acids; physiology of virus-infected plants; and potato virus diseases.

Animal Virus—Virus inhibitors and chemotherapy of virus; arthropod-borne viruses and arthropod vectors of viruses; virus infection in chick embryo; and African horse sickness in India.

Seminar

The third seminar on Electrochemistry organised by the Central Electrochemical Research Institute, Karaikudi will be held at the Institute during Dec. 26-29, 1961. The previous two seminars were organised by the Institute in April and December 1960.

Prof. M. S. Thacker, Director-General, Scientific & Industrial Research, is expected to inaugurate the seminar.

More than 70 papers contributed by the research staff of the Institute and scientists and technologists in India and abroad (U.S.S.R., U.S.A., Japan and Hungary) will be presented and discussed in the following six sections : Electrode-kinetics, electrochemical equilibria and electroanalysis; Electro-organic and inorganic products; Electrothermics and electrometallurgy; Metal finishing and electro-deposition; Corrosion; and Batteries.

Prof. M. S. Thacker

Prof. M. S. Thacker, Secretary to the Government of India and Educational Adviser (Technical), Ministry of Scientific Research & Cultural Affairs and Director General, Scientific & Industrial Research, who left for Hong Kong on Nov. 28, 1961 for attending the *Unesco Second Regional Meeting on Scientific Research* returned to New Delhi on Dec. 3, 1961.

CPHERI Executive Council

An Executive Council has been constituted for the Central Public Health Engineering Research Institute (CPHERI), Nagpur. It consists of the following members : Shri Y.B. Chavan, Chief Minister of Maharashtra (*Chairman*); Shri N.V. Modak; Shri R. D Varma; Shri K.N Bhargava; Major K. N. Rao; two representatives of Ministry of Health, Govt. of India; Col. Barkat Narain; Dr. B. V Bhoota; Shri Babubhai M. Chinai; Shri S.T. Raja; Shri P. C. Bose; Shri D. N. Jha; Prof. M. S. Thacker, Director-General, CSIR, New Delhi; Financial Adviser to CSIR; and R.S. Mehta, Director, CPHERI (*Members*).

PERSONAL

Appointments

Sarvashri M. S. Murthy, Hira Lal Narang & S. S. Sachdeva —Pool Officers, IIP (Oct. 10 Oct. 28 and Nov. 10, 1961 respectively).

Promotions

Shri R. Subramanian—Curator : Grade I, NPL, New Delhi (May 18, 1961).

Shri S. K. Ghosh—Curator : Grade I, BITM, Calcutta (Nov. 23, 1961.

Shri R. C. Chandra—Curator : Grade II, BITM, Calcutta (Nov. 25, 1961).

Sarvashri N. C. Chakravarti, N. R. Srinivasan & R. M. Palit—Senior Scientific Officers : Grade II, CRRI, New Delhi (Nov. 18, 1961).

Shri B. Garudadwajan, P. A. (Tech.) to Director, CGCRI, Calcutta—Documentation Officer, IIP (Nov. 13, 1961).

Sarvashri S. K. Gupta, J. N. Malhotra, K. L. Sethi, K. P. Nair & Trilok Nath—Junior Scientific Officers, CRRI, New Delhi (Nov. 6, 1961).

Sarvashri P. R. Hariharan & R. S. Mahajan—Junior Scientific Officers, CEERI, Pilani (Nov. 17, 1961).

Deputations

Sarvashri A.V. Venkatesh, R.K. Gupta, Arjun Dev & B. A. Chitanavis, Research Fellows, IIP—*France* : Training in research and development in Fuels and Lubricants including Engine Testing at the Institute Francais du Petrole, Paris.

Shri S. K. Ghosh, Research Fellow, IIP—*France* : Training in pilot plant work on Crude Oil Evaluation and Hydro-refining at the Institut Francais du Petrole.

Shri H. V. Bhaskar Rao, Asst. Director, NML, Jamshedpur—Resumed duty after completion of his deputation abroad as Member-Secretary of the Productivity Team on Refractories Industries under the National Productivity Council (Oct. 30, 1961).

(*Contd. on p. 4, col. 1*)

Dr. N. K. Patwardhan

We regret to announce that Dr. N. K. Patwardhan, Asst. Director, CBRI, Roorkee passed away on Nov. 28, 1961 due to heart failure.

B R I E F S

Building Symposium

The two-day symposium on 'Functional Efficiency of Buildings' organised by the Central Building Research Institute, Roorkee concluded on Nov. 14, 1961. Engineers and architects from research institutions, Defence organisation, universities, Government and industrial concerns attended the symposium.

The symposium was inaugurated by Lt. Gen. H. Williams, Director, CBRI, Roorkee. Eighteen papers presented and discussed at the symposium in four technical sessions covered the following aspects in building construction : thermal comfort, climatology, acoustics, illumination, testing and standardisation of testing procedures. Prof. V.N. Prasad, Deputy Director, Indian Institute of Technology, Kharagpur, Dr. A.N. Ghosh, Joint Director, Indian Standards Institution, New Delhi, Dr. L.A. Ramdas, Assistant Director, National Physical Laboratory, New Delhi and Prof. T.N. Seshadri, formerly Assistant Director, CBRI presided over the technical sessions.

Medicinal and Aromatic Plants Symposium

The symposium on 'Production and Utilization of Medicinal and Aromatic Plants in India' organised by the Regional Research Laboratory, Jammu (*CSIR News*, Vol. 11, No. 13, p.2) was held in the Laboratory during November 27-29, 1961. The symposium was inaugurated by Shri Karan Singh, Sadar-i-Riyasat, Jammu & Kashmir and presided over by Col. R.N. Chopra.

Eighty-seven delegates representing 46 different organisations all over the country including national laboratories, universities, research institutes, state governments and pharmaceutical industries participated in the symposium. Hundred and nine research papers were presented and discussed in five sessions.

Science Museum and Planetarium

This illustrated booklet gives in popular language a brief account of the 'Science Museum and Planetarium located in the campus of the National Physical Laboratory, New Delhi. The Museum was established in 1956 with the object of stimulating popular interest in physical sciences and displays exhibits covering developments in electricity, magnetism, optics, heat, light, sound, measurement of time, exploration of space, etc.

A large number of exhibits at the Museum have been received as donations from Unesco, Science Museum, London and other organisations.

Technical Information Bulletin

This publication, recently brought out by the National Metallurgical Laboratory, Jamshedpur describes in popular language the important contributions of the Laboratory for the development of mineral and metal industry in India. Amongst the various products and processes developed in the Laboratory, mention has been made in the publication of the following: production of nickel-free austenitic stainless steels (Thackeron), electrical resistance alloys, ferro-alloys from indigenous raw materials, electrolytic manganese metal and manganese dioxide, magnesium metal from dolomite, graphite crucibles and refractories and processes for hot-dip aluminising of ferrous materials and chemical polishing of aluminium. Brief accounts of pilot plant studies on production of iron from non-coking coal, in low-shaft furnace, beneficiation of low-grade manganese ores, and smelting of ferroalloys are also included.

Executive Council Meeting

The first meeting of the Executive Council of the Central Public Health Engineering Research Institute, Nagpur was held at Bombay on Nov. 17, 1961. Shri Y.B. Chavan, Chief Minister of Maharashtra and Chairman of the Executive Council presided.

Mr. Nigel Calder's Visit to India

Mr. Nigel Calder, Science Editor, *New Scientist*, London arrived at New Delhi on Nov. 15, 1961 at the invitation of CSIR. During his three-week stay in India he had discussions with Prof. M.S. Thacker, Director-General, CSIR and Officers of the Publications Directorate on various aspects of dissemination of scientific information and popularisation of science. Mr. Calder visited the following national laboratories: NPL (including Insdoc), New Delhi ; CDRI, Lucknow; CRRI, New Delhi; CGCRI, Calcutta; IIBEM, Calcutta; CFRI, Jealgora; CMRS, Dhanbad; NML, Jamshedpur; CLRI, Madras; CFTRI, Mysore; NAL, Bangalore; and NCL, Poona. He left New Delhi on Dec. 9, 1961.

CMRS, DHANBAD – Mr. Nigel Calder with Dr. K.N. Sinha, Officer-on-Special Duty during his visit to the Station on Nov. 24, 1961

RESEARCH IN PROGRESS

National Laboratories

CFRI, JEALGORA

Determination of Ash and Moisture in Washed Coal—Conventional methods of determining ash in washed coals are time-consuming and fail to help timely adjustment of plant conditions during operation for necessary control of the quality of coals. A simple method has, therefore, been developed for the rapid determination of both ash and surface moisture of washed products. The method which consists in weighing the product in air, in water and in zinc chloride solution (sp. gr., 1.25) takes only 10 minutes and is accurate within ± 0.3 per cent for ash and ± 0.8 per cent for moisture—A.K. Chakravarti, A.G. Saha & G.G. Sarkar.

CLRI, MADRAS

Fat Liquors for White Leather—A process has been standardised for the production of fat liquor, based on coconut oil for fat liquoring white tanned leathers.

In the process, coconut oil is mixed with other non-oxidising vegetable and animal oils which do not turn yellow on ageing, to facilitate sulphonation. The sulphated oils are specially suited for fat liquoring of leathers prepared by chrome, syntan, zirconium and aluminium tannages.

Pilot plant trials of the process are in progress at the Institute.

Quick Tanning Process—A quick and economic process for E. I. tanning of leathers has been developed utilizing tanning agents prepared from indigenous materials. The process which reduces the period of tanning from 39 to 9 days, utilizes lesser number of pits, vats and machinery.

The process consists in unhairing the soaked hides and skins with sulphide, liming for 2-3 days, and fleshing and scudding. The scudded pelts, after pretreatment with calgon, are left for 3 days in vegetable tan liquor (strength 10-15°Bk) and then transferred and left in myrob liquor for a day or two, and oiled and dried.

CRRI, NEW DELHI

Traffic Accidents Study—An analysis of road traffic accidents in Delhi has been made.

The analysis indicates that (i) Trucks alone are the cause of 42 per cent of fatal accidents; (ii) the worst sufferers in the fatal accidents comprise mostly the pedestrians and cyclists; (iii) rash driving alone is the the cause in about 80 per cent of total fatal accidents; and(iv) about 50 per cent of total accidents occur as a result of collision of one vehicle with another; majority of these are rear-end collisions followed by head-on collisions.

Sponsored Research

Storage of Fruits—Studies on the best way of keeping in storage the fruits, mango, orange, pineapple and litchi have been in progress. The following conclusions have been reached :

Lakshanbhog variety of mangoes keep well for 35 days, and Fazli and Langra varieties for 21 days when stored in a refrigerator under a carbon dioxide atmosphere of 6 per cent. Fruits used as controls lose appearance and suffer from cold injury within 15 days of storage.

Treatment of Nagpur and Darjeeling varieties of oranges with 2, 4-D hormone retards ripening as well as colour development at room temperature. The storage life of oranges increases by 450-500 per cent when they are treated with hormone 2, 4-D and wax-coated.

Kew variety of pineapple of both summer and winter seasons can be stored best at a temperature of 75°F. A combination of wax coating and treatment with hormone 2, 4, 5-T (500 p.p.m.) nearly doubles the storage life of pineapples.

Litchies can keep well for a period of 4 weeks in an atmosphere of carbon dioxide—A. N. Bose, and S. B. Lodh, Jadavpur University, Calcutta.

Photosynthesis of Amino Acids—Experiments on the photosynthesis of amino acids from paraformaldehyde using catalysts, molybdic acid, colloidal oxides of molybdenum and iron individually as well as together, and haematoporphyrin are in progress. A sterilized mixture of paraformaldehyde, catalyst and distilled water exposed to sunlight for 450 hr produced the amino acids, proline, alanine and serine. The same acids were synthesised to a greater extent when paraformaldehyde was replaced by tartaric acid.

Colloidal oxides of molybdenum and iron also produced the same acids in higher concentrations. With haematoporphyrin, glycine was synthesised—K. Bahadur & K. M. Agarwal, University of Allahabad, Allahabad.

Separation of Heavy Metals—Methods for the separation of uranium (VI), barium, strontium, lead (II), and zirconium (IV) from fission products have been developed on the basis of studies on the cation exchange behaviour of uranium (VI), barium, lead (II) and stronium on Amberlite IR-120 and Dowex 50W-X8 and anion exchange behaviour of uranium (VI) and zirconium (IV) on Dowex 21K.

Using 2-thenoyltrifluoroacetone as the chelating and colorimetric reagent, methods for the simultaneous extraction and spectrophotometric determination of cerium (IV), uranium (IV), chromium (III) and cobalt (II) have been worked out. Conditions for the quantitative extraction of vanadium (V) and iron (III) using tri-n-butyl phosphate have been established — A. K. De, S.M. Khopkar & S. K. Majumdar, Jadavpur University, Calcutta.

Photochemical Reactions—The photochemical reaction between glycerol and potassium dichromate has been investigated under varying concentrations of hydrogen ion, glycerol and dichromate. The rate of photochemical reaction was negligible in neutral and alkaline solutions and varied linearly with glycerol concentration (1.74 to 3.49*M*); linear variation was also observed with moderate concentrations of potassium dichromate (0.005 to 0.025 *M*). At very low concentrations of dichromate, the linearity was not maintained—(Miss) K. K. Rohtagi & P. K. Bhattacharya, Department of Chemistry, Jadavpur University, Calcutta.

Mr. Barlag at CMERI

Mr. Th. Barlag, Managing Director, Norwegian Association for Mechanical Technology, has joined CMERI, Durgapur as adviser under the UNTA Programme, for one year in the first instance, from Oct. 27, 1961. He will be mainly responsible for the organisation and development of the Materials Section in the Institute.

Born in 1914 in Oslo (Norway), Mr. Barlag studied chemistry and chemical engineering at the University of Oslo (1931-33) and the Dresden Technical University, Germany (1933-38). He had a wide variety of experience during 1939-48 in the production of paints, presswood, magnesium metal, rectification of alcohol and production of heat insulating material out of peat. He served the Government-owned Norwegian Ammunition Factory as Engineer-in-charge. He was the head of the Laboratory for Testing Materials including raw materials, production control and was also sales manager for military ammunition.

CFRI Foundation Lecture

The Eleventh CFRI Foundation Lecture will be delivered by Prof. Humayun Kabir, Minister of Scientific Research and Cultural Affairs, on 'Science & Modern World' on January 2, 1962.

PERSONAL

(*Contd. from p. 1, col. 3*)

SHRI M. P. DHIR, Senior Scientific Officer, CRRI, New Delhi—Returned from U. S. A. on completion of his training in Highway Engineering, under the Point Four Programme (Nov. 6, 1961).

Nominations

Dr. K. N. MATHUR, Director, CSIO, New Delhi—Member, Committee on Utilization of Solar Energy, CSIR.

SHRI H. C. BHATNAGAR, Officer-on-special Duty, CFTRI, Mysore—Member, Sub-Committee of the Horticulture Development Board for considering difficulties in transport reduction of freight and marketing of fruits, vegetables, etc., Indian Council of Agricultural Research, New Delhi.

The following officers have been nominated members of various committees of the Indian Standards Institution :

SHRI P. I. A. NARAYANAN, Officer-in-charge (Ore Dressing), NML, Jamshedpur—*Ores and Raw Materials Sectional Committee.*

SHRI H. V. MIRCHANDANI, Asst. Director, CBRI, Roorkee—*Building Materials and Components Sampling Sectional Committee.*

SHRI R. M. KRISHNAN, Asst. Director, NML, Jamshedpur—*Foundry Sectional Committee.*

Honours & Awards

Dr. D. K. ROY, Senior Scientific Officer, IIBEM, Calcutta—Fellow, Royal Institute of Chemistry, U.K.

SHRI C. R. GUPTA, Officer-on-special Duty (Workshop), CRRI, New Delhi—Awarded a sum of Rs. 1,000 by the Khadi and Village Industries Commission, Bombay for his *Charkha* model submitted in the Commission's Prize Scheme.

SHRI M. G. GEORGE, Research Follow, CSIR scheme, Problems of Fish Culture in Delhi (University of Delhi, Delhi) has been declared qualified for the award of Ph. D. degree for his thesis : *Plankton Ecology of Fish Tanks in relation to Fish Culture in Delhi State.*

PATENTS & PROCESSES

Patents Filed

INDIA

76997 : *Improvements in or relating to the production of copper powder by electrolytic process*—S. R. Ranganathan, NML, Jamshedpur.

77713 : *A process for the production of 5-keto-D gluconic acid and its salts*—I. J. Babbar, M.C. Srinivasan, H.G. Vartak & V. Jagannathan, NCL, Poona.

79075 ; *Improvements in/and or relating to the two stage electrochemical production of dialdehyde starch from starch*—H. V. Udupa, M. S. Venkatachlapathy & R. Ramaswamy, CECRI, Karaikudi.

U. S. A.

137, 734 : *Modification of aluminium base alloys containing silicon*—S. S. Bhatnagar, P. K. Gupte, B. R. Nijhawan & G. G. Nair, NML, Jamshedpur.

Patents Accepted

71333 : *Improvements in or relating to exterior house paints*—Atma Ram, S. B. Roy & H. D. Sircar, CGCRI, Calcutta.

71467 : *Improvements in or relating to traffic paints*—Atma Ram, S. B. Roy & H. D. Sircar, CGCRI, Calcutta.

Processes Leased Out

The following processes have been leased out for commercial development :

1. Improving the storage life of cashew kernels (Indian Pat. Nos. 49838 & 53319), CFTRI, Mysore—*Colonial Distributors, Irinjalakuda* (Kerala State).
2. Pectin and tartrate from tamarind fruit pulp (Indian Pat. No. 52617), CFTRI, Mysore—*Kissan Products Limited, Bangalore.*
3. Hot dip aluminising of ferrous materials (Indian Pat. Nos. 55289, 57938 & 65230), NML, Jamshedpur—*Gujrat Aluminising Corporation, Ahmedabad; Elka Industries, Kalyani, W. Bengal; and Hind Steel Company, Delhi-Shahdra.*
4. Rubber base contact adhesive (Indian Pat. No. 65977), NCL, Poona—*Bensen Industries, Howrah.*
5. Latex cement (Indian Pat. No. 66298), CLRI, Madras—*Bensen Industries, Howrah.*

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CSIR NEWS

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State Award for JSIR

The *Journal of Scientific & Industrial Research* has been awarded 'Certificate of Merit' in the Category: Periodicals (Other than Annuals)—English, for excellence in printing and designing in the competition organized by the Ministry of Information & Broadcasting for 1961.

Shri S.B. Deshaprabhu, Production Officer, Publications Directorate received the prize on behalf of the CSIR from Shri Lal Bahadur Shastri, Union Home Minister, at a ceremony held at Vigyan Bhawan, New Delhi on Dec. 21, 1961.

MEETING

A meeting of the Chairmen, Research Committees of the CSIR will be held in the Conference Room of the CSIR Secretariat, New Delhi on Jan. 20, 1962 at 10.00 a.m. Prof. M. S. Thacker, Director-General, Scientific & Industrial Research, will preside.

PERSONAL

Appointments

SHRI C.V. SABNIS—Senior Scientific Officer: Grade I, CPHERI, Nagpur (Dec. 1, 1961).

SHRI RAJINDER GUPTA—Project Officer, CIMPO, New Delhi (Dec. 11, 1961)

SHRI M. G. TAMHANKAR—Senior Scientific Officer: Grade II, CBRI, Roorkee (Dec. 2, 1961).

SHRI DWIJENDRANATH RATH—Junior Scientific Officer, NML, Jamshedpur (Nov. 20. 1961).

SHRI V. V. SASIDARAN—Junior Scientific Officer, CBRI, Roorkee (Nov. 20, 1961).

Promotions

SHRI M. RAMAIAH—Senior Scientific Officer: Grade I, CBRI, Roorkee (Dec. 2, 1961).

SHRI N.V. RAMAN—Senior Scientific Officer: Grade II, CBRI, Roorkee (Dec. 2, 1961).

SARVASHRI HARDYAL SINGH DEWAN & T.M. SRINIVASAN—Junior Scientific Officer, CEERI, Pilani (Nov. 17, 1961 & Nov. 29, 1961 respectively).

SHRI K. VENUGOPALAN—Junior Scientific Officer, CECRI, Karaikudi (Nov. 15, 1961).

SHRI D. RANGE GOWDA—Junior Scientific Officer, CIMPO, New Delhi (Nov. 22, 1961).

Resignations

DR. K. L. ARORA—Senior Scientific Officer: Grade II, CDRI, Lucknow (Nov. 20, 1961).

SHRI M.M. SINGH—Stores & Purchase Officer, CBRI, Roorkee (Nov. 16, 1961).

Deputations

SHRI A.K. MOITRA—Asst. Director, CFRI, Jealgora—*U.S.S.R.* Member, Indian delegation on behalf of the National Coal Development Corporation, for examination of the project report of Kathara Washery.

SHRI PRABHUNATH, Junior Scientific Officer, CGCRI, Calcutta—*U.K.*: Training in Glass Technology under the Commonwealth Scholarship Programme (Sept. 18, 1961).

SHRI T.S. KRISHNAN, Junior Scientific Officer, CLRI, Madras—*France*: Training in Mineral Tannages under the Indo-French Technical Cooperation Agreement (Oct. 16, 1961).

DR. R. BHASKARAN, Junior Scientific Officer, CLRI, Madras—*France*: Training in Biological Aspects of Leather Manufacture under the Indo-French Technical Cooperation Agreement (Dec. 2, 1961).

DR. T. BANERJEE, Deputy Director, NML, Jamshedpur—Returned to India after completion of his six-week tour of France under the Indo-French Technical Cooperation Agreement.

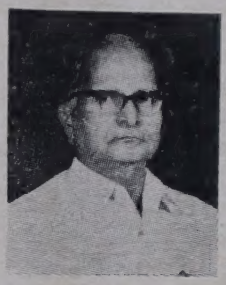
SHRI N. SUBRAMANIAN, Senior Scientific Officer, CLRI, Madras—Returned from Czechoslavokia on completion of his training in Production Management sponsored by the National Productivity Council (Dec. 11, 1961).

DR. H. J. ARNIKAR, Reader in Nuclear Chemistry, Banaras Hindu University and Investigator-in-charge of CSIR schemes returned

(*Contd. on p. 4, col. 2*)

Dr. M. S. Krishnan

Dr. Maharajapuram Sitaram Krishnan, lately Professor of Geology and Geophysics, Andhra University, Waltair has been appointed Director, Central Board of Geophysics, Calcutta with effect from Oct. 13, 1961.



Dr. Krishnan (*b.* Aug. 24, 1898; Maharajapuram, Madras State) got his early education at Tanjore, Trichinopoly and at the Presidency College, Madras. After obtaining B.A. (Hons) and M.A. degrees in Geology from the Madras University in 1919 and 1921 respectively, he proceeded to U.K. for higher studies at the Imperial College, London, where he obtained the A.R.C.S. and D.I.C. diplomas and the Ph.D. degree. On returning he joined the Geological Survey of India in 1924 as Asst. Superintendent (Geologist) and was promoted as Superintending Geologist in 1942. After working as Director, Indian Bureau of Mines for about 2 years (from November 1948 to January 1951) he was appointed Director, Geological Survey of India. In August 1955, he joined the Ministry of Natural Resources and Scientific Research, New Delhi as Mineral Adviser and ex-officio Joint Secretary and in 1957 was appointed Director, Indian School of Mines, Dhanbad. After retiring from Government service in 1958, he joined the Andhra University.

Dr. Krishnan has carried out extensive geological mapping as well as investigations on various mineral deposits (particularly of iron) in different parts of India, and studied atomic mineral deposits in U.K., U.S.A. and Canada during 1947.

He is associated with various learned societies dealing with earth sciences in India and abroad including the Bureau of the International

(*Contd. on p. 4, col. 1*)

BRIEFS

Symposium on Carbonisation of Non-caking Coals

A three-day symposium on 'Low Temperature Carbonisation of Non-caking Coals and Lignites and Briquetting of Coal Fines' held at the Regional Research Laboratory (RRL), Hyderabad during Nov. 20-22, 1961 was inaugurated by Prof. M. S. Thacker, Director-General, Scientific & Industrial Research. Shri S. B. P. Pattabhi Rama Rao, Minister for Education, Govt. of Andhra Pradesh and Chairman of the Executive Council of the Laboratory presided over the Inaugural function.

Seventy-three papers received from scientists from India and abroad were presented and discussed in following four sessions : (i) Briquetting of coal fines (Chairman : Dr. M.S. Iyengar, Central Fuel Research Institute, Jealgora); (ii) Low temperature carbonisation (LTC) of non-caking coals and lignites (Chairman: Dr. M.G. Krishna, RRL, Hyderabad); (iii) Utilisation of products from LTC (Chairman : Dr. S. K. Sircar, Calcutta) ; (iv) Survey, economics and statistics of LTC products (Shri S. K. Nargundkar, General Manager, The Singareni Collieries Co. Ltd., Kothagudem).

Fuel scientists and technologists from research, scientific and technological institutions and universities, and representatives of Central Government ministries, Railways, Government of India undertakings, State Governments, collieries and industries participated in the symposium. Directors of the following foreign firms also attended the symposium : Lurgi Gesellschaft fur Warmetechnik, Fa. Heinrich Koppers, Maschinenfabrik Buckau R. wolf, Pinstsch Bamag Aktiengesellschaft of Germany and Rexco Research and Development Company of U. K.

Along with the symposium, an exhibition of coal and coal products and processes and equipment for carbonising and briquetting of coal was arranged in which exhibits of the Laboratory and those received from various organisations in India and foreign firms were displayed.

RRL, HYDERABAD—Prof. M.S. Thacker, Director-General, Scientific & Industrial Research inaugurating the symposium on Low-temperature Carbonisation of Coals

SITRA Technological Conference

The Second Annual Technological Conference of the South India Textile Research Association (SITRA), Coimbatore held on Nov. 25, 1961 was inaugurated by Mr. A.E. Cooper, Financial Director, Madura Mills Company Limited. The following subjects were discussed at the conference in two technical sessions : Fibre tests and their significance; Effect of twist factor of back material and break-draft on the ring frame on yarn quality ; End breaks in different departments; Relation between the tensile properties of fibre bundles and yarn in dry and wet states; Effect on card waste and yarn quality of modified lickerin cover; and Effect on yarn properties of extending the stripping cycle on the card.

'Service Unit' for Instruments

The Central Scientific Instruments Organization (CSIO), New Delhi is setting up a 'Service Unit' for overhauling and repairs of specialised electrical and electronic instruments, facilities for which are not generally available in the country. In the initial stages the Unit will provide service facilities to CSIR laboratories and other research institutions in India.

With a view to assess the requirements of service manuals and spare parts of the instruments, information is being collected on the types of specialised apparatus available with laboratories and institutions by issuing questionaires.

CSIR Laboratories and Units

This 28-page booklet gives comprehensive information on the organisation, functions and activities of the Council of Scientific & Industrial Research. Brief account of the scope of research of its 27 national laboratories and research stations and field units is also included.

Copies of the publication are available from the Publications Directorate, CSIR, New Delhi.

Building Digest

The December 1961 issue of the Building Digest (second in the series being brought out by the Central Building Research Institute, Roorkee) is concerned with *Emulsion Paints*. The first number of the series was issued last month (*CSIR News*, Vol. 11, No. 22, p. 2).

Copies of the Digest are available free from the Director, Central Building Research Institute, Roorkee.

Open Day at CECRI

The Central Electrochemical Research Institute (CECRI), Karaikudi remained open to public from Dec. 15 to Dec. 24, 1961. An exhibition dispalying various products and processes developed by the Institute was also arranged for visitors.

RESEARCH IN PROGRESS

National Laboratories

NML, JAMSHEDPUR

Recovery of Iron from Classifier Sand and Heavy Slime—Studies on the beneficiation of classifier sand from the Noamundi Washing Plant (assaying Fe, 59.40; SiO_2, 1.95; and Al_2O_3, 6.28 per cent) have shown that straight jigging of the sand could produce a concentrate (Fe, 61.10 per cent) with a higher recovery for iron (82. 6 per cent) than that by jigging-spiral combined treatment. The jig and spiral mixed concentrate assayed 62.26 per cent iron but the total recovery of iron from the concentrate was only 55.8 per cent.

A sample of heavy slime from the settling tank at Noamundi Washing Plant (assaying Fe, 59.12; SiO_2, 5.19 and Al_2O_3, 6.41 per cent and containing 84.3 per cent of -325 mesh material) on subjecting to spiral treatment produced a concentrate assaying 60.54 per cent Fe, but with a recovery of only 29.9 per cent Fe.

CDRI, LUCKNOW

Antifertility Compounds—Intratesticular administration of a single dose of cadmium chloride sterilizes male rats, rabbits, goats and rhesus monkeys. Male rats lose their fertility after 24 hours of administration of the salt. A basic similarity in the sequence of changes evolved in the testis of different animals has been observed.

No effect on fertility except for the failure of a significant percentage of ova to implant is observed in the females.

IIBEM, CALCUTTA

Test for Leprosy—The comparative reliability of the two tests for diagnosis of leprosy namely, complement-fixation using lepromin and haemagglutination using tuberculin-X has been assessed by tests on clinically diagnosed leprosy cases. The former test showed higher percentage of positivity and proved to be a specific and better method for diagnosis than the latter method—A.N. Roy.

Sponsored Research

Polyurethanes for Foam Rubber—Processes for the preparation of phenyl isocyanate and toluene diisocyanate suitable for production of foam rubber have been standardised.

The process for the preparation of phenyl isocyanate consists in passing phosgene into a suspension of aniline hydrochloride in toluene and separating the product by fractionation under vacuum.

2 : 4-Tolylene diisocyanate has been prepared by a novel technique, using a fluidised bed reactor. In the process, 2 : 4-tolylenediamine vapours and carbonyl chloride gas are passed through catalysts such as barium chloride, zinc chloride, sodium bisulphate, impregnated over bleached clay and maintained in the fluidized state at 300-400°. Conditions for preparation of toluene diisocyanate in liquid medium have also been standardised —R.T. THAMPY & S.R. GOEL, Shri Ram Institute for Industrial Research, Delhi.

Preparation of Ethylene Oxide—Optimum conditions for the preparation of ethylene oxide from ethanol on a pilot plant scale by one-step process have been established. In the process, a mixture of bauxite and reduced silver (1: 1) is used as catalyst, barium peroxide as promoter, and nitric oxide vapour as an additional oxidising agent. A yield of 21 per cent of ethylene oxide is obtained by the process.—N.R. KULOOR & S.H. IBRAHIM, Department of Chemical Technology & Chemical Engineering, Indian Institute of Science, Bangalore.

Research Papers

Water-proofing of a shell roof with aluminium foil—H.V. Mirchandani, A.K. Bhowmik & J.S. Sharma, CBRI, Roorkee. *Indian Concr. J.*, **35** (1961) 388-89.

Design of transmission lime tower foundations: Comparison of some methods of design—S. Venkatesan, CBRI, Roorkee. *Nat Build. Org., J.*, **6** (1961), 263.

Report on recent conferences in Europe—G.S. Ramaswamy, CBRI, Roorkee. *Cement Concr.*, **2** (1961), *Engng. News* (*India*), 96-100.

Soil engineering research at the Central Building Research Institute—A. C. Banerjee, CBRI, Roorkee **13** (1961), 381-83.

Short bored piles in shallow black cotton soils—Dinesh Mohan & Subhash Chandra, CBRI, Roorkee. *Nat. Build Org. J.*, **6** (1961), 197-202.

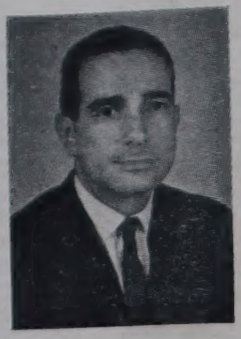
Separating skin friction and point bearing in a short bored pile—G.S. Jain & Virendra Kumar, CBRI, Roorkee, *Nat. Build. Org. J.*, **6** (1961), 217-22.

Action of X-irradiation on *E. coli* —S.R. Bhattacharjee, Saha Institute of Nuclear Physics, Calcutta. *Radiation Res.*, **14** (1961), 50-55.

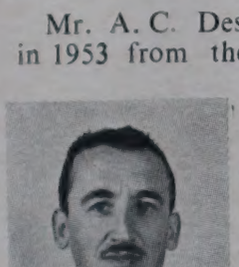
NML, JAMSHEDPUR—Sarvashri J.R.D. Tata, J.J. Ghandy and J.D. Choksi during their visit on Dec. 8, 1961

French Experts for Petroleum Institute

Mr. M. F. Venot and Mr. A. C. Destanque of the French Institute of Petroleum (F.I.P.), Paris joined the Indian Institute of Petroleum (IIP), Camp New Delhi with effect from Oct. 11, 1961. This brings the total number of experts assisting in the establishment of the IIP to six.



Mr. M. F. Venot after graduation in 1950 from the Engineering School of Marseilles, specialized in the problems relating to lubricating oils. He worked with Socony Mobil Oil, Morocco and then with Houghton, as Chief Engineer of the Department of Lubricants and Greases before joining the Application Division of the French Institute of Petroleum.



Mr. A. C. Destanque graduated in 1953 from the Eecole National Superieure de Chimie, Bordeauz and subsequently, from the Ecole Nationale Superieure du Petrole. He got his licence es-Sciences Physique and Diploma of Superior Studies in Sciences. At the F.I.P. he had been working as Research Engineer in the Chemistry Division of the Institute on problems of distillation, extraction, absorption, etc.

(*Contd. from p. 1, col. 3*)

Union of Geodesy and Geophysics. He was a member of several scientific delegations to international conferences including the Royal Society-Empire Scientific Conference in England in 1946, U.N. Conference on Natural Resources at Lake Success in 1949 and the 20th International Geological Congress in Mexico in 1956 (as leader). He was a member of the U.N. Expert Committee on World Iron Ore Resources which submitted its report in 1954.

Dr. Krishnan has published over 120 papers on various geological subjects, many of them being original contributions to Indian geology. 'The Geology of Gangpur State (Orissa)', 'Mineral Resources of Madras Province', 'Structural & Tectonic History of India', and 'Iron Ores, Iron and Steel' are some of his important publications. He is author of text books, 'Introduction to the Geology of India' and 'Geology of India and Burma' and has revised (with Dr. K. Jocob) the lexicon of 'Indian Geological Terminology' published under the auspices of the International Geological Congress.

PERSONAL

(*Contd. from p. 1, col. 2*)

to India on completion of his six-week tour of Japan and Australia. In Japan, he was President of a Section of the Conference on Radio-isotopes held by the Atomic Energy Commission, Japan. He also visited Manila and Australia where he delivered lectures on special invitation.

PATENTS & PROCESSES

Patents Filed

78778 : *A method of making chocolate coloured bricks from alluvial soil*—L.C. Jain, P.C. Jain & E.S.H. Lal, CBRI, Roorkee.

79388 : *A process for the manufacture of Gaylite—a bloated clay aggregate—from the silt deposited by the river Hooghly*—S.K. Chopra & Krishan Lal, CBRI, Roorkee.

79597 : *Improvements in a continuous vertical counter current solids-gas reactor*—M.J. Shahani, NML, Jamshedpur.

79598 : *An improved process for the continuous vapour phase degressing of metallic wire and strip*—M.J. Shahani, NML, Jamshedpur.

Patents Accepted

70049 : *Manufacture of vegetable milk powder*—N.L. Lahiry, L.V.L. Sastry, S.R. Shurpalekar, M.R. Chandrasekhara, M. Swaminathan & V. Subrahmanyan, CFTRI, Mysore.

70555 : *An air separator*—Y.K.R. Rao, CFTRI, Mysore.

71754 : *Surface-active agents from cashewnut shell liquid*—S.C. Sathi, B.C.S. Rao, (Miss) S.B. Kulkarni, S.S. Katti & J.S. Gujral, NCL, Poona.

Patents Sealed

67636 : *An improved process relating to thermal polymerisation of unsaturated fatty acids*—B.G. Sharma & R.K. Bhatnagar, Shri Ram Institute for Industrial Research, Delhi.

Nominations

DR. ATMA RAM, Director, CGCRI, Calcutta—Coopted Member, Committee appointed by the Ministry of Scientific Research & Cultural Affairs to consider and recommend to Government measures to be taken to encourage Development of Research in Industries and Promotion of Consultancy Firms; and Member, Indian Railway Equipment Advisory Committee, Railway Board, Ministry of Railway.

DR. B.R. NIJHAWAN, Director, NML, Jamshedpur and Dr. M.S. KRISHNAN, Director, CBG, Calcutta—Members, Technical Committee on Minerals of the Natural Resources Committee, Planning Commission.

DR A. LAHIRI, Director, CFRI, Jealgora—Member, Technical Committees on Energy and Minerals of the Natural Resources Committee, Planning Commission.

67822 : *A process for the extraction of phenols from coal tar oil fractions or coal hydrogenation oils*—J.G. Shah, A.N. Basu & A. Lahiri, CFRI, Jealgora.

67932 : *Improvement in or relating to the process of separation and isolation of the physiologically active principles of nim oil*—C. Mitra, NCL, Poona.

69250 : *Improvements in or relating to the manufacture of abrasive articles*—V. Nagarajan & R.T. Thampy, Shri Ram Institute for Industrial Research, Delhi.

70172 : *An improved process for or relating to manufacture of vinyl esters in general and vinyl acetate in particular*—S. Ramanujam, R.K. Bhatnagar & N.R. Kuloor, Shri Ram Institute for Industrinal Research, Delhi.

70889 : *A process for the production of graft-copolymers from natural rubber*—C.C. Menon & S.L. Kapur, NCL, Poona.

Processes Leased Out

The following processes developed by the CFTRI, Mysore have been leased out for commercial development:

1. Spin-cooker cooler (Pasteuriser for canned acid foods (Indian Pat. No. 69697)—*Gardners Corporation*, New Delhi.

2. Pectin and tartrate from tamarind fruit pulp (Indian Pat. No 52617)—*Hindustan Dyestuffs & Chemicals*, Ahmedabad.

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